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Revised proposal to encode Hanifi Rohingya in Unicode

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1 Introduction

This is a proposal to encode the Hanifi Rohingya script in Unicode. It supersedes the following documents:

- L2/12-214 “Preliminary Proposal to Encode the Rohingya Script”
- L2/12-278R “Proposal to encode the Hanifi Rohingya script in Unicode”

It incorporates comments made in:

- L2/16-037 “Recommendations to UTC #146 January 2016 on Script Proposals”

In addition to various editorial changes, the major changes from previous versions include:

- Enhancements of various glyph shapes.
- Revision of the representative form for the letter MA.
- Re-analysis of the variant forms of DA and LA as glyphic variants.
- Addition of mechanism for breaking shaping of final forms.
- Expanded description of the usage of *tatweel*.

2 Background

Hanifi Rohingya (𐴌𐴟𐴖𐴝𐴙𐴚𐴒𐴧𐴘𐴝 *ruwainggya*, 𐴌𐴟𐴇𐴝𐴙𐴚𐴒𐴧𐴘𐴝 *ruhainggya*) is used for writing Rohingya (ISO 639-3: rhg), an Indo-Aryan language spoken by one million people in Myanmar (Rakhine State) and by 200,000 people in Bangladesh (Cox’s Bazaar District). The language is also spoken in several other countries as a result of the dispersion of the Rohingya community on account of persecution in Myanmar. Four scripts are used for writing Rohingya: Burmese, Arabic, Latin, and the present one.

The script was developed by a committee led by Maulana Mohammed Hanif in the 1980s. A chart containing the finalized script is shown in figure 1. The script is influenced by Arabic; however, it is a modern construction and has no direct genetic affiliation to any particular writing system.

There is limited information available on the Hanifi Rohingya script in English. Most of the materials on the script are written in the Rohingya language. The Rohingya Language Committee and the Rohingya Education Board Myanmar have published multilingual primers of the script (see figures 4–17). The script is used for the publication of books and newspapers, which are hand-written and printed. Typefaces have been developed by Muhammad Noor.

3 Script Details

3.1 Structure

Hanifi Rohingya is an alphabetic script that is written from right to left. Consonant letters possess an inherent vowel /ɔ/. Apart from the inherent vowel all other vowels are expressed using letter-like marks. The inherent vowel is changed by placing a vowel mark after the consonant. A bare consonant is produced by placing a vowel-silencing mark after a letter, which suppresses the inherent vowel. An independent and word-initial vowel is represented using a combination of a vowel carrier and a vowel mark. Vowel length is indicated using tonal signs, which are placed above a letter or vowel mark. Nasalization is indicated using a mark that is placed after a letter or vowel mark. Consonant gemination is indicated using a combining sign placed above a letter.

The script is structurally conjoining and is modelled upon Arabic. Letters join to adjacent letters at the baseline. Letters have different forms when they occur in initial, medial, and final positions in a word. In several hand-written and printed sources, the baseline between letters and marks may not completely connect. This is unintentional and results from casual hand writing or glyph design in a font. In texts printed using digitized fonts, the connections between letters are more consistently maintained.

Spacing is used for separating words. Latin and Arabic punctuation signs are commonly used for delimiting text segments, eg. periods, commas, colons, hyphens. The available sources do not show any specific linebreaking features, such as hyphens. A *tatweel*-like elongation mark is often used for justification.

3.2 Script name

The name ‘Hanifi Rohingya’ is assigned to the Unicode script block. Thiis name is preferred because it precisely identifies the script. As the Rohingya language is written in various scripts, referring to the script block as simply ‘Rohingya’ would present ambiguity.

3.3 Character names

Names for characters are based upon Latin transliterations of Rohingya forms given in various script primers (see tables 1 and 2 for comparisons). The character names are normalized in accordance with naming conventions for South Asian scripts in Unicode. This approach aligns with the Latin names given for the majority of letters across the available publications. In cases where there are multiple names for a character, an appropriate name has been chosen based upon consultation with the user community. Names for tonal signs and other marks are based upon Indigenous names.

3.4 Representative glyphs

The representative glyphs are derived from the “Rohingya Gonya Leyka Noories” typeface developed by Muhammad Noor. The glyphs are used with permission. Original glyphs have been modified and additional glyphs have been introduced by the proposal author.

4 Character repertoire

The proposed repertoire for ‘Hanifi Rohingya’ contains 49 characters.

4.1 Letters

There are 28 letters, as shown below with positional forms:

	Character name	Value	Join	Final	Medial	Initial
𐴀	HANIFI ROHINGYA LETTER A	/ɔ/	left	—	—	𐴀
𐴁	HANIFI ROHINGYA LETTER BA	/b/	dual	𐴁	𐴁	𐴁
𐴂	HANIFI ROHINGYA LETTER PA	/p/	dual	𐴂	𐴂	𐴂
𐴃	HANIFI ROHINGYA LETTER TA	/t/	dual	𐴃	𐴃	𐴃
𐴄	HANIFI ROHINGYA LETTER TTA	/ʈ/	dual	𐴄	𐴄	𐴄
𐴅	HANIFI ROHINGYA LETTER JA	/ɟ/	dual	𐴅	𐴅	𐴅
𐴆	HANIFI ROHINGYA LETTER CA	/c/	dual	𐴆	𐴆	𐴆
𐴇	HANIFI ROHINGYA LETTER HA	/h/	dual	𐴇	𐴇	𐴇
𐴈	HANIFI ROHINGYA LETTER KHA	/x/	dual	𐴈	𐴈	𐴈
𐴉	HANIFI ROHINGYA LETTER FA	/f/	dual	𐴉	𐴉	𐴉
𐴊	HANIFI ROHINGYA LETTER DA	/d/	dual	𐴊	𐴊	𐴊
𐴋	HANIFI ROHINGYA LETTER DDA	/ɖ/	dual	𐴋	𐴋	𐴋
𐴌	HANIFI ROHINGYA LETTER RA	/r/	dual	𐴌	𐴌	𐴌
𐴍	HANIFI ROHINGYA LETTER RRA	/ɽ/	dual	𐴍	𐴍	𐴍
𐴎	HANIFI ROHINGYA LETTER ZA	/z/	dual	𐴎	𐴎	𐴎
𐴏	HANIFI ROHINGYA LETTER SA	/s/	dual	𐴏	𐴏	𐴏
𐴐	HANIFI ROHINGYA LETTER SHA	/ʃ/	dual	𐴐	𐴐	𐴐
𐴑	HANIFI ROHINGYA LETTER KA	/k/	dual	𐴑	𐴑	𐴑

𐴒	HANIFI ROHINGYA LETTER GA	/g/	dual	‍𐴒	‍𐴒‍	𐴒‍
𐴓	HANIFI ROHINGYA LETTER LA	/l/	dual	‍𐴓	‍𐴓‍	𐴓‍
𐴔	HANIFI ROHINGYA LETTER MA	/m/	dual	‍𐴔	‍𐴔‍	𐴔‍
𐴕	HANIFI ROHINGYA LETTER NA	/n/	dual	‍𐴕	‍𐴕‍	𐴕‍
𐴖	HANIFI ROHINGYA LETTER WA	/ʋ/	dual	‍𐴖	‍𐴖‍	𐴖‍
𐴗	HANIFI ROHINGYA LETTER KINNA WA	/u/	dual	‍𐴗	‍𐴗‍	𐴗‍
𐴘	HANIFI ROHINGYA LETTER YA	/j/	dual	‍𐴘	‍𐴘‍	𐴘‍
𐴙	HANIFI ROHINGYA LETTER KINNA YA	/i/	dual	‍𐴙	‍𐴙‍	𐴙‍
𐴚	HANIFI ROHINGYA LETTER NGA	/ŋ/	dual	‍𐴚	‍𐴚‍	𐴚‍
𐴛	HANIFI ROHINGYA LETTER NYA	/ɲ/	dual	‍𐴛	‍𐴛‍	𐴛‍

Only the isolated form of a letter is encoded. The positional forms will exist as glyphs in a font and will be substituted at the shaping level.

Although not part of the original script, a letter 𐴜 was used by some individuals for representing /v/. It was not formally approved as part of the script. The letter 𐴖 WA is now used in its place. Nonetheless, it may be neccessary to encode 𐴜 (*HANIFI ROHINGYA LETTER VA) in order to support documents that contain it.

4.2 Vowel marks

There are 5 vowel marks:

	Character name	Value	Join	Final	Medial	Initial
𐴝	HANIFI ROHINGYA VOWEL MARK A	/a/	dual	‍𐴝	‍𐴝‍	𐴝‍
𐴞	HANIFI ROHINGYA VOWEL MARK I	/i/	dual	‍𐴞	‍𐴞‍	𐴞‍
𐴟	HANIFI ROHINGYA VOWEL MARK U	/u/	dual	‍𐴟	‍𐴟‍	𐴟‍
𐴠	HANIFI ROHINGYA VOWEL MARK E	/e/	dual	‍𐴠	‍𐴠‍	𐴠‍
𐴡	HANIFI ROHINGYA VOWEL MARK O	/o/	dual	‍𐴡	‍𐴡‍	𐴡‍

4.3 Vowel silencer

The following character is used for indicating a bare consonant:

	Character name	Value	Join	Final	Medial	Initial
𐴢	HANIFI ROHINGYA MARK SAKIN	—	right	𐴢	—	—

4.4 Nasalization mark

There is one character for marking nasalization:

	Character name	Value	Join	Final	Medial	Initial
𐴣	HANIFI ROHINGYA MARK NA KHANNA	/n/	dual	𐴣	𐴣	—

4.5 Tonal signs

Three combining signs are used for representing tones:

	Character	tone type
◌𐴤	HANIFI ROHINGYA SIGN HARBAHAY	short high tone
◌𐴥	HANIFI ROHINGYA SIGN TAHALA	long falling tone
◌𐴦	HANIFI ROHINGYA SIGN TANA	long rising tone

4.6 Gemination sign

The following combining sign is used for indicating consonant gemination:

	Character
◌𐴧	HANIFI ROHINGYA SIGN TASSI

4.7 Digits

There is a full set of decimal digits:

	Character	Value
𐴰	HANIFI ROHINGYA DIGIT ZERO	0
𐴱	HANIFI ROHINGYA DIGIT ONE	1
𐴲	HANIFI ROHINGYA DIGIT TWO	2
𐴳	HANIFI ROHINGYA DIGIT THREE	3
𐴴	HANIFI ROHINGYA DIGIT FOUR	4
𐴵	HANIFI ROHINGYA DIGIT FIVE	5
𐴶	HANIFI ROHINGYA DIGIT SIX	6
𐴷	HANIFI ROHINGYA DIGIT SEVEN	7
𐴸	HANIFI ROHINGYA DIGIT EIGHT	8
𐴹	HANIFI ROHINGYA DIGIT NINE	9

5 Encoding Model

5.1 Shaping model

The shaping model for Rohingya follows that for Arabic. Each encoded character is placed sequentially in the input stream. The appropriate positional form for each letter will be substituted at the shaping and font layers. In the examples below the 'input' shows the sequential order of characters in the input stream. The 'shaped glyphs' show the substitutions that result from processing. The 'output' depicts the final display.

Input →	Shaped glyphs ←	Output ←
𐴁 BA, 𐴁 BA, 𐴁 BA	𐴁 + 𐴁 + 𐴁	𐴁𐴁𐴁
𐴑 KA, 𐴃 TA, 𐴁 BA	𐴁 + 𐴃 + 𐴑	𐴑𐴃𐴁
𐴇 HA, 𐴌 RA, 𐴉 FA	𐴉 + 𐴌 + 𐴇	𐴇𐴌𐴉

In general, positional forms of letters are identical to their isolated shape. The difference is typographic: positional glyphs have edges at the baseline for facilitating connections. The letter 𐴔 MA differs from other letters because its isolated form is distinct from its initial form:

Input →	Shaped glyphs ←	Output ←
𐴔 MA, 𐴔 MA, 𐴔 MA	𐴔 + 𐴔 + 𐴔	𐴔𐴔𐴔
𐴏 SA, 𐴓 LA, 𐴔 MA	𐴔 + 𐴓 + 𐴏	𐴏𐴓𐴔

If the final form of 𐴔 MA should be rendered similar to the initial shape, it is necessary to break the regular shaping behavior described above. In such a case, the general character U+200C ZERO WIDTH NON-JOINER can be placed after the letter to produce the desired output:

Input →	Shaped glyphs ←	Output ←
𐴔 MA, 𐴔 MA	𐴔 + 𐴔	𐴔𐴔
𐴔 MA, 𐴔 MA, ZWNJ	𐴔 + 𐴔	𐴔𐴔

As 𐴔 MA is the only letter with such positional distinctions, the usage of U+200C ZERO WIDTH NON-JOINER with other characters should not trigger different behaviors.

5.2 Stylistic variants

The following letters have variant forms:

LA The 𐴓 is a stylized version of 𐴓 LA in which the terminal is curled. It is a glyphic variant.

DA The 𐴊 is used in early materials for isolated and word-final forms of 𐴊 DA. It inherently represents a bare consonant and cannot be followed by SAKIN. It is used in script charts (see figures 1, 4, 6) and in running text. However, as described in figure 2, 𐴊 was replaced by 𐴊𐴧 <𐴊 DA, 𐴧 SAKIN>, as seen in the charts in figures 5, 7, 8. This 𐴊 may be considered a glyphic variant of the ligature 𐴊𐴧 and may be represented by substituting the sequence <𐴊 DA, 𐴧 SAKIN> with a dedicated glyph in a font.

DDA The 𐴋 is an older form of 𐴋 DDA (see explanation in figures 2).

5.3 Representation of bare consonants

The mark 𐴧 SAKIN is used for indicating a bare consonant. It joins only to the preceding letter and occurs only in final position. It is similar in function to ْ U+0652 ARABIC SUKUN. The mark is placed after a letter in the encoded sequence:

b	𐴁𐴢	<𐴁 BA, 𐴢 SAKIN>
p	𐴂𐴢	<𐴂 PA, 𐴢 SAKIN>
t	𐴃𐴢	<𐴃 TA, 𐴢 SAKIN>
m	𐴔𐴢	<𐴔 MA, 𐴢 SAKIN>

The letter 𐴔 MA is an isolated form and inherently represents a the bare consonant /m/. However, in some instances users may prefer to depict the letter with SAKIN, as shown above.

The SAKIN indicates an isolated letter as well as a bare consonant in word-final position. Its usage is optional. There are no formal conventions regarding its use. It occurs most frequently in script charts. But, even in such cases the usage of SAKIN is inconsistent. For example, the script chart in figure 7 shows SAKIN written with every letter (except for MA), including the vowel carrier 𐴀 ROHINGYA LETTER A. On the other hand, figures 4, 5, 6 show SAKIN with only certain letters, which are enumerated below:

𐴁𐴢	𐴁	BA	𐴈𐴢	𐴈	KHA	𐴒𐴢	𐴒	GA
𐴂𐴢	𐴂	PA	𐴉𐴢	𐴉	FA	𐴓𐴢	𐴓	LA
𐴃𐴢	𐴃	TA	𐴊𐴢	𐴊	DA	𐴖𐴢	𐴖	WA
𐴄𐴢	𐴄	TTA	𐴏𐴢	𐴏	SA	𐴗𐴢	𐴗	KINNA WA
𐴇𐴢	𐴇	HA	𐴐𐴢	𐴐	SHA	𐴙𐴢	𐴙	KINNA YA

The chart showing the finalized script as approved by the committee led by Maulana Mohammad Hanif in 1980 does not show the mark SAKIN with any letter (see figure 1), except possibly with 𐴙 KINNA YA (𐴙𐴢).

5.4 Representation of vowels

The letter 𐴀 A is both an independent vowel letter and a vowel carrier. When followed by a vowel mark it represents the independent or word-initial form of that vowel. When it occurs in isolation or without a following vowel mark it has the value /ɔ/.

a	𐴀	<𐴀 A>
ā	𐴀𐴝	<𐴀 A, 𐴝 VOWEL MARK A>
i	𐴀𐴞	<𐴀 A, 𐴞 VOWEL MARK I>
u	𐴀𐴟	<𐴀 A, 𐴟 VOWEL MARK U>
e	𐴀𐴠	<𐴀 A, 𐴠 VOWEL MARK E>
o	𐴀𐴡	<𐴀 A, 𐴡 VOWEL MARK O>

A consonant-vowel syllable is represented in the same manner:

ba	𐴁	<𐴁 BA>
bā	𐴁𐴝	<𐴁 BA, 𐴝 VOWEL MARK A>
bi	𐴁𐴞	<𐴁 BA, 𐴞 VOWEL MARK I>
bu	𐴁𐴟	<𐴁 BA, 𐴟 VOWEL MARK U>
be	𐴁𐴠	<𐴁 BA, 𐴠 VOWEL MARK E>
bo	𐴁𐴡	<𐴁 BA, 𐴡 VOWEL MARK O>

A vowel mark cannot be followed by another vowel mark. A sequence of vowel sounds is represented in two ways: 1) by using the vowel-carrier letter 𐴀 A for each additional vowel mark; and 2) as diphthongs (see section 5.5). The first method is shown below:

bāe	𐴁𐴝𐴀𐴠	<𐴁 BA, 𐴝 VOWEL MARK A, 𐴀 A, 𐴠 VOWEL MARK E>
bāo	𐴁𐴝𐴀𐴡	<𐴁 BA, 𐴝 VOWEL MARK A, 𐴀 A, 𐴡 VOWEL MARK O>

Moreover, vowel marks are not used independently. Script charts show vowel marks in isolation. Such depictions are intended for illustrating the mark and do not indicate valid usage.

Vowel length and pitch is indicated using tonal signs (see section 5.7).

5.5 Representation of diphthongs

The letters 𐴙 KINNA YA and 𐴗 KINNA WA are used for writing diphthongs. The KINNA YA 'small *ya*' represents a semi-vowel glide (/j/, /i/) and KINNA WA 'small *wa*' represents the glide (/w/, /u/).

bai	𐴁𐴙	<𐴁 BA, 𐴙 KINNA YA>
bāi	𐴁𐴝𐴙	<𐴁 BA, 𐴝 VOWEL MARK A, 𐴙 KINNA YA>
bui	𐴁𐴟𐴙	<𐴁 BA, 𐴟 VOWEL MARK U, 𐴙 KINNA YA>
boi	𐴁𐴡𐴙	<𐴁 BA, 𐴡 VOWEL MARK O, 𐴙 KINNA YA>
bou	𐴁𐴡𐴗	<𐴁 BA, 𐴡 VOWEL MARK O, 𐴗 KINNA WA>

5.6 Representation of nasalization

The 𐴣 HANIFI ROHINGYA MARK NA KHANNA is used for indicating vowel nasalization. It should occur only after a letter or vowel mark:

baṃ 𐴁𐴣 <𐴁 BA, 𐴣 NA KHANNA>

bāṃ 𐴁𐴝𐴣 <𐴁 BA, 𐴝 VOWEL MARK A, 𐴣 NA KHANNA>

baṃba 𐴁𐴣𐴁 <𐴁 BA, 𐴣 NA KHANNA, 𐴁 BA>

5.7 Representation of tones

A tonal sign is placed after a vowel mark in the input stream. Usage of the ◌𐴤 SIGN HARBAHAY for indicating a short high tone is as follows:

bá 𐴁𐴝𐴤 <𐴁 BA, 𐴝 VOWEL MARK A, ◌𐴤 SIGN HARBAHAY>

bí 𐴁𐴞𐴤 <𐴁 BA, 𐴞 VOWEL MARK I, ◌𐴤 SIGN HARBAHAY>

bú 𐴁𐴟𐴤 <𐴁 BA, 𐴟 VOWEL MARK U, ◌𐴤 SIGN HARBAHAY>

bé 𐴁𐴠𐴤 <𐴁 BA, 𐴠 VOWEL MARK E, ◌𐴤 SIGN HARBAHAY>

bó 𐴁𐴡𐴤 <𐴁 BA, 𐴡 VOWEL MARK O, ◌𐴤 SIGN HARBAHAY>

The ◌𐴥 SIGN TAHALA, a long falling tone, is expressed as follows:

bȁ 𐴁𐴝𐴥 <𐴁 BA, 𐴝 VOWEL MARK A, ◌𐴥 SIGN TAHALA>

bȉ 𐴁𐴞𐴥 <𐴁 BA, 𐴞 VOWEL MARK I, ◌𐴥 SIGN TAHALA>

bȕ 𐴁𐴟𐴥 <𐴁 BA, 𐴟 VOWEL MARK U, ◌𐴥 SIGN TAHALA>

bȅ 𐴁𐴠𐴥 <𐴁 BA, 𐴠 VOWEL MARK E, ◌𐴥 SIGN TAHALA>

bȍ 𐴁𐴡𐴥 <𐴁 BA, 𐴡 VOWEL MARK O, ◌𐴥 SIGN TAHALA>

Usage of the ◌𐴦 SIGN TANA for indicating a long rising tone is as follows:

bā́ 𐴁𐴝𐴦 <𐴁 BA, 𐴝 VOWEL MARK A, ◌𐴦 SIGN TANA>

bī́ 𐴁𐴞𐴦 <𐴁 BA, 𐴞 VOWEL MARK I, ◌𐴦 SIGN TANA>

bū́ 𐴁𐴟𐴦 <𐴁 BA, 𐴟 VOWEL MARK U, ◌𐴦 SIGN TANA>

bḗ 𐴁𐴠𐴦 <𐴁 BA, 𐴠 VOWEL MARK E, ◌𐴦 SIGN TANA>

bṓ 𐴁𐴡𐴦 <𐴁 BA, 𐴡 VOWEL MARK O, ◌𐴦 SIGN TANA>

As is evident in the available sources, the placement of tonal signs is not uniform. In some instances the sign HARBAHAY is placed above the base letter or between it and the following letter. The signs TAHALA and TANA may be positioned above the letter preceding the vowel mark, above the vowel mark, or between the letter and vowel mark. These may be considered stylistic choices.

5.8 Representation of consonant gemination

The ◌𐴧 HANIFI ROHINGYA SIGN TASSI is used for indicating consonant gemination. In function it is similar to ◌ّ U+0651 ARABIC SHADDA. The sign is placed after the respective letter in the encoded sequence, but rendered above the letter in the output:

baba 𐴁𐴁 <𐴁 BA, 𐴁 BA>

babba 𐴁𐴁𐴧 <𐴁 BA, 𐴁 BA, ◌𐴧 TASSI>

If there is a vowel mark after the doubled letter, then the TASSI is placed before the vowel mark in the encoded sequence:

babbā 𐴁𐴁𐴧𐴝 <𐴁 BA, 𐴁 BA, ◌𐴧 TASSI, 𐴝 VOWEL MARK A >

5.9 Digits

As in Arabic, the Hanifi Rohingya digits are written from left to right.

𐴰𐴱𐴲𐴳𐴴 <𐴰 ZERO, 𐴱 ONE, 𐴲 TWO, 𐴳 THREE, 𐴴 FOUR>

𐴵𐴶𐴷𐴸𐴹 <𐴵 FIVE 𐴶 SIX, 𐴷 SEVEN, 𐴸 EIGHT, 𐴹 NINE>

The Arabic style ٠ U+0660 ARABIC DIGIT ZERO is attested as a glyphic variant for 𐴰 ZERO.

5.10 Punctuation

There is no script-specific punctuation. The following characters are commonly used for delimiting various text boundaries:

- ، U+060C ARABIC COMMA
- ؛ U+061F ARABIC SEMICOLON
- ؟ U+061F ARABIC QUESTION MARK
- ۔ U+06D4 ARABIC FULL STOP

These marks of punctuation should be extended for use with Hanifi Rohingya.

5.11 Elongation

Elongation of the baseline connection between letters is commonly used in Hanifi Rohingya for justification and other spacing-filling purposes. This elongation is similar to the *tatweel* in Arabic. This feature can be implementing in Rohingya by using the ـ U+0640 ARABIC TATWEEL. The ARABIC TATWEEL can be placed repetitively after any letter or mark in any position within a word. The elongation should not break across the end of a line.

<BA, BA>

<BA, ـ ARABIC TATWEEL, BA>

<BA, ـ ARABIC TATWEEL, ـ ARABIC TATWEEL, BA>

<BA, ـ ARABIC TATWEEL, BA, ـ ARABIC TATWEEL>

5.12 Collation

The sort order for Hanifi Rohingya is as follows:

A < VOWEL MARK A < VOWEL MARK I < VOWEL MARK U < VOWEL MARK E < VOWEL MARK O < BA < PA < TA < TTA < JA < CA < HA < KHA < FA < DA < DDA < RA < RRA < ZA < SHA < SA < KA < GA < LA < MA < NA KHANNA < NA < WA < KINNA WA < YA < KINNA YA < NGA < NYA < SAKIN

6 Character data

6.1 Unicode Character Data

```
10D00;HANIFI ROHINGYA LETTER A;Lo;0;AL;;;;;N;;;;;
10D01;HANIFI ROHINGYA LETTER BA;Lo;0;AL;;;;;N;;;;;
10D02;HANIFI ROHINGYA LETTER PA;Lo;0;AL;;;;;N;;;;;
10D03;HANIFI ROHINGYA LETTER TA;Lo;0;AL;;;;;N;;;;;
10D04;HANIFI ROHINGYA LETTER TTA;Lo;0;AL;;;;;N;;;;;
10D05;HANIFI ROHINGYA LETTER JA;Lo;0;AL;;;;;N;;;;;
10D06;HANIFI ROHINGYA LETTER CA;Lo;0;AL;;;;;N;;;;;
10D07;HANIFI ROHINGYA LETTER HA;Lo;0;AL;;;;;N;;;;;
10D08;HANIFI ROHINGYA LETTER KHA;Lo;0;AL;;;;;N;;;;;
10D09;HANIFI ROHINGYA LETTER FA;Lo;0;AL;;;;;N;;;;;
10D0A;HANIFI ROHINGYA LETTER DA;Lo;0;AL;;;;;N;;;;;
10D0B;HANIFI ROHINGYA LETTER DDA;Lo;0;AL;;;;;N;;;;;
10D0C;HANIFI ROHINGYA LETTER RA;Lo;0;AL;;;;;N;;;;;
10D0D;HANIFI ROHINGYA LETTER RRA;Lo;0;AL;;;;;N;;;;;
10D0E;HANIFI ROHINGYA LETTER ZA;Lo;0;AL;;;;;N;;;;;
10D0F;HANIFI ROHINGYA LETTER SA;Lo;0;AL;;;;;N;;;;;
10D10;HANIFI ROHINGYA LETTER SHA;Lo;0;AL;;;;;N;;;;;
10D11;HANIFI ROHINGYA LETTER KA;Lo;0;AL;;;;;N;;;;;
10D12;HANIFI ROHINGYA LETTER GA;Lo;0;AL;;;;;N;;;;;
10D13;HANIFI ROHINGYA LETTER LA;Lo;0;AL;;;;;N;;;;;
10D14;HANIFI ROHINGYA LETTER MA;Lo;0;AL;;;;;N;;;;;
10D15;HANIFI ROHINGYA LETTER NA;Lo;0;AL;;;;;N;;;;;
10D16;HANIFI ROHINGYA LETTER WA;Lo;0;AL;;;;;N;;;;;
10D17;HANIFI ROHINGYA LETTER KINNA WA;Lo;0;AL;;;;;N;;;;;
10D18;HANIFI ROHINGYA LETTER YA;Lo;0;AL;;;;;N;;;;;
10D19;HANIFI ROHINGYA LETTER KINNA YA;Lo;0;AL;;;;;N;;;;;
10D1A;HANIFI ROHINGYA LETTER NGA;Lo;0;AL;;;;;N;;;;;
10D1B;HANIFI ROHINGYA LETTER NYA;Lo;0;AL;;;;;N;;;;;
10D1C;HANIFI ROHINGYA VOWEL MARK A;Lo;0;AL;;;;;N;;;;;
10D1D;HANIFI ROHINGYA VOWEL MARK I;Lo;0;AL;;;;;N;;;;;
10D1E;HANIFI ROHINGYA VOWEL MARK U;Lo;0;AL;;;;;N;;;;;
10D1F;HANIFI ROHINGYA VOWEL MARK E;Lo;0;AL;;;;;N;;;;;
10D20;HANIFI ROHINGYA VOWEL MARK O;Lo;0;AL;;;;;N;;;;;
10D21;HANIFI ROHINGYA MARK SAKIN;Lo;0;AL;;;;;N;;;;;
10D22;HANIFI ROHINGYA MARK NA KHANNA;Lo;0;AL;;;;;N;;;;;
10D23;HANIFI ROHINGYA SIGN HARBAHAY;Mn;230;NSM;;;;;N;;;;;
10D24;HANIFI ROHINGYA SIGN TAHALA;Mn;230;NSM;;;;;N;;;;;
10D25;HANIFI ROHINGYA SIGN TANA;Mn;230;NSM;;;;;N;;;;;
10D26;HANIFI ROHINGYA SIGN TASSI;Mn;230;NSM;;;;;N;;;;;
10D30;HANIFI ROHINGYA DIGIT ZERO;Nd;0;AN;;0;0;0;N;;;;;
10D31;HANIFI ROHINGYA DIGIT ONE;Nd;0;AN;;1;1;1;N;;;;;
10D32;HANIFI ROHINGYA DIGIT TWO;Nd;0;AN;;2;2;2;N;;;;;
10D33;HANIFI ROHINGYA DIGIT THREE;Nd;0;AN;;3;3;3;N;;;;;
10D34;HANIFI ROHINGYA DIGIT FOUR;Nd;0;AN;;4;4;4;N;;;;;
10D35;HANIFI ROHINGYA DIGIT FIVE;Nd;0;AN;;5;5;5;N;;;;;
10D36;HANIFI ROHINGYA DIGIT SIX;Nd;0;AN;;6;6;6;N;;;;;
10D37;HANIFI ROHINGYA DIGIT SEVEN;Nd;0;AN;;7;7;7;N;;;;;
10D38;HANIFI ROHINGYA DIGIT EIGHT;Nd;0;AN;;8;8;8;N;;;;;
10D39;HANIFI ROHINGYA DIGIT NINE;Nd;0;AN;;9;9;9;N;;;;;
```

6.2 Linebreaking

```
10D00..10D1B;AL  # Lo   [28] HANIFI ROHINGYA LETTER A..HANIFI ROHINGYA LETTER NYA
10D1C..10D20;BA  # Lo   [21] HANIFI ROHINGYA VOWEL MARK A..HANIFI ROHINGYA VOWEL MARK O
```

```
10D21;BA         # Lo        HANIFI ROHINGYA MARK SAKIN
10D22;BA         # Lo        HANIFI ROHINGYA MARK NA KHANNA
10D23..10D25;CM  # Mn    [3] HANIFI ROHINGYA SIGN HARBAHAY..HANIFI ROHINGYA SIGN TANA
10D26;CM         # Mn        HANIFI ROHINGYA SIGN TASSI
10D30..10D31;NU  # Nd   [10] HANIFI ROHINGYA DIGIT ZERO..HANIFI ROHINGYA DIGIT NINE
```

6.3 Arabic Shaping Data

```
10D00; HANIFI ROHINGYA LETTER A; L; HANIFI ROHINGYA A
10D01; HANIFI ROHINGYA LETTER BA; D; HANIFI ROHINGYA BA
10D02; HANIFI ROHINGYA LETTER PA; D; HANIFI ROHINGYA PA
10D03; HANIFI ROHINGYA LETTER TA; D; HANIFI ROHINGYA TA
10D04; HANIFI ROHINGYA LETTER TTA; D; HANIFI ROHINGYA TTA
10D05; HANIFI ROHINGYA LETTER JA; D; HANIFI ROHINGYA JA
10D06; HANIFI ROHINGYA LETTER CA; D; HANIFI ROHINGYA CA
10D07; HANIFI ROHINGYA LETTER HA; D; HANIFI ROHINGYA HA
10D08; HANIFI ROHINGYA LETTER KHA; D; HANIFI ROHINGYA KHA
10D09; HANIFI ROHINGYA LETTER FA; D; HANIFI ROHINGYA PA
10D0A; HANIFI ROHINGYA LETTER DA; D; HANIFI ROHINGYA DA
10D0B; HANIFI ROHINGYA LETTER DDA; D; HANIFI ROHINGYA DDA
10D0C; HANIFI ROHINGYA LETTER RA; D; HANIFI ROHINGYA RA
10D0D; HANIFI ROHINGYA LETTER RRA; D; HANIFI ROHINGYA RRA
10D0E; HANIFI ROHINGYA LETTER ZA; D; HANIFI ROHINGYA ZA
10D0F; HANIFI ROHINGYA LETTER SA; D; HANIFI ROHINGYA SA
10D10; HANIFI ROHINGYA LETTER SHA; D; HANIFI ROHINGYA SHA
10D11; HANIFI ROHINGYA LETTER KA; D; HANIFI ROHINGYA KA
10D12; HANIFI ROHINGYA LETTER GA; D; HANIFI ROHINGYA GA
10D13; HANIFI ROHINGYA LETTER LA; D; HANIFI ROHINGYA LA
10D14; HANIFI ROHINGYA LETTER MA; D; HANIFI ROHINGYA MA
10D15; HANIFI ROHINGYA LETTER NA; D; HANIFI ROHINGYA NA
10D16; HANIFI ROHINGYA LETTER WA; D; HANIFI ROHINGYA WA
10D17; HANIFI ROHINGYA LETTER KINNA WA; HANIFI ROHINGYA KINNA WA
10D18; HANIFI ROHINGYA LETTER YA; D; HANIFI ROHINGYA YA
10D19; HANIFI ROHINGYA LETTER KINNA YA; D; HANIFI ROHINGYA KINNA YA
10D1A; HANIFI ROHINGYA LETTER NGA; D; HANIFI ROHINGYA NGA
10D1B; HANIFI ROHINGYA LETTER NYA; D; HANIFI ROHINGYA NYA
10D1C; HANIFI ROHINGYA VOWEL MARK A; D; HANIFI ROHINGYA VOWEL MARK A
10D1D; HANIFI ROHINGYA VOWEL MARK I; D; HANIFI ROHINGYA NA KHANNA
10D1E; HANIFI ROHINGYA VOWEL MARK U; D; HANIFI ROHINGYA VOWEL MARK U
10D1F; HANIFI ROHINGYA VOWEL MARK E; D; HANIFI ROHINGYA VOWEL MARK E
10D20; HANIFI ROHINGYA VOWEL MARK O; D; HANIFI ROHINGYA VOWEL MARK O
10D21; HANIFI ROHINGYA MARK SAKIN; R; HANIFI ROHINGYA MARK SAKIN
10D22; HANIFI ROHINGYA MARK NA KHANNA; D; HANIFI ROHINGYA MARK NA KHANNA
```

6.4 Script Extensions

The following characters should be extended for usage in Rohingya:

```
0640 ; # Lm  ARABIC TATWEEL
060C ; # Po  ARABIC COMMA
061B ; # Po  ARABIC SEMICOLON
061F ; # Po  ARABIC QUESTION MARK
06D4 ; # Po  ARABIC FULL STOP
```

6.5 'Confusable' Characters

Some Rohingya letters resemble those found of Arabic. Attention to these 'confusables' is particularly important because Arabic is commonly used in Rohingya documents.

```
10D03 HANIFI ROHINGYA LETTER PA         ;  0648 ARABIC LETTER WAW
10D07 HANIFI ROHINGYA LETTER HA         ;  06BE ARABIC LETTER HEH DOACHASHMEE
10D08 HANIFI ROHINGYA LETTER KHA        ;  06A9 ARABIC LETTER KEHEH
10D09 HANIFI ROHINGYA LETTER FA         ;  06CF ARABIC LETTER WAW WITH DOT ABOVE
10D0B HANIFI ROHINGYA LETTER DDA        ;  0637 ARABIC LETTER TAH
10D0C HANIFI ROHINGYA LETTER RRA        ;  0637 ARABIC LETTER TAH
10D11 HANIFI ROHINGYA LETTER KA         ;  0637 ARABIC LETTER TAH
10D12 HANIFI ROHINGYA LETTER GA         ;  FECB ARABIC LETTER AIN INITIAL FORM
10D13 HANIFI ROHINGYA LETTER LA         ;  0644 ARABIC LETTER LAM
10D14 HANIFI ROHINGYA LETTER MA         ;  FEE3 ARABIC LETTER MEEM INITIAL FORM
10D19 HANIFI ROHINGYA LETTER KINNA YA   ;  FE91 ARABIC LETTER BEH INITIAL FORM
10D1D HANIFI ROHINGYA LETTER NA KHANNA  ;  0632 ARABIC LETTER ZAIN
10D1D HANIFI ROHINGYA LETTER NA KHANNA  ;  FEE7 ARABIC LETTER NOON INITIAL FORM
10D1E HANIFI ROHINGYA VOWEL MARK A      ;  FEBB ARABIC LETTER SAD INITIAL FORM
10D24 HANIFI ROHINGYA SIGN TAHALA       ;  0654 ARABIC HAMZA ABOVE
10D25 HANIFI ROHINGYA SIGN TANA         ;  0653 ARABIC MADDAH ABOVE
10D26 HANIFI ROHINGYA SIGN TASSI        ;  0651 ARABIC SHADDA
```

7 References

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	10D0	10D1	10D2	10D3
0	10D00	10D10	10D20	10D30
1	10D01	10D11	10D21	10D31
2	10D02	10D12	10D22	10D32
3	10D03	10D13	10D23	10D33
4	10D04	10D14	10D24	10D34
5	10D05	10D15	10D25	10D35
6	10D06	10D16	10D26	10D36
7	10D07	10D17		10D37
8	10D08	10D18		10D38
9	10D09	10D19		10D39
A	10D0A	10D1A		
B	10D0B	10D1B		
C	10D0C	10D1C		
D	10D0D	10D1D		
E	10D0E	10D1E		
F	10D0F	10D1F		

Letters

10D00 𐴀 HANIFI ROHINGYA LETTER A
10D01 𐴁 HANIFI ROHINGYA LETTER BA
10D02 𐴂 HANIFI ROHINGYA LETTER PA
10D03 𐴃 HANIFI ROHINGYA LETTER TA
10D04 𐴄 HANIFI ROHINGYA LETTER TTA
10D05 𐴅 HANIFI ROHINGYA LETTER JA
10D06 𐴆 HANIFI ROHINGYA LETTER CA
10D07 𐴇 HANIFI ROHINGYA LETTER HA
10D08 𐴈 HANIFI ROHINGYA LETTER KHA
10D09 𐴉 HANIFI ROHINGYA LETTER FA
10D0A 𐴊 HANIFI ROHINGYA LETTER DA
10D0B 𐴋 HANIFI ROHINGYA LETTER DDA
10D0C 𐴌 HANIFI ROHINGYA LETTER RA
10D0D 𐴍 HANIFI ROHINGYA LETTER RRA
10D0E 𐴎 HANIFI ROHINGYA LETTER ZA
10D0F 𐴏 HANIFI ROHINGYA LETTER SA
10D10 𐴐 HANIFI ROHINGYA LETTER SHA
10D11 𐴑 HANIFI ROHINGYA LETTER KA
10D12 𐴒 HANIFI ROHINGYA LETTER GA
10D13 𐴓 HANIFI ROHINGYA LETTER LA
10D14 𐴔 HANIFI ROHINGYA LETTER MA
10D15 𐴕 HANIFI ROHINGYA LETTER NA
10D16 𐴖 HANIFI ROHINGYA LETTER WA
10D17 𐴗 HANIFI ROHINGYA LETTER KINNA WA
10D18 𐴘 HANIFI ROHINGYA LETTER YA
10D19 𐴙 HANIFI ROHINGYA LETTER KINNA YA
10D1A 𐴚 HANIFI ROHINGYA LETTER NGA
= gan
10D1B 𐴛 HANIFI ROHINGYA LETTER NYA
= nayya

Vowel marks

10D1C 𐴜 HANIFI ROHINGYA VOWEL MARK A
= aa-for
10D1D 𐴝 HANIFI ROHINGYA VOWEL MARK I
= i-for
10D1E 𐴞 HANIFI ROHINGYA VOWEL MARK U
= u-for
10D1F 𐴟 HANIFI ROHINGYA VOWEL MARK E
= e-for
10D20 𐴠 HANIFI ROHINGYA VOWEL MARK O
= o-for

Vowel silencer

10D21 𐴡 HANIFI ROHINGYA MARK SAKIN

Nasalization mark

10D22 𐴢 HANIFI ROHINGYA MARK NA KHANNA

Tonal signs

10D23 ◌𐴣 HANIFI ROHINGYA SIGN HARBAHAY
• short high tone
10D24 ◌𐴤 HANIFI ROHINGYA SIGN TAHALA
• long falling tone
10D25 ◌𐴥 HANIFI ROHINGYA SIGN TANA
• long rising tone

Gemination sign

10D26 ◌𐴦 HANIFI ROHINGYA SIGN TASSI

Digits

10D30 𐴰 HANIFI ROHINGYA DIGIT ZERO
10D31 𐴱 HANIFI ROHINGYA DIGIT ONE
10D32 𐴲 HANIFI ROHINGYA DIGIT TWO
10D33 𐴳 HANIFI ROHINGYA DIGIT THREE
10D34 𐴴 HANIFI ROHINGYA DIGIT FOUR
10D35 𐴵 HANIFI ROHINGYA DIGIT FIVE
10D36 𐴶 HANIFI ROHINGYA DIGIT SIX
10D37 𐴷 HANIFI ROHINGYA DIGIT SEVEN
10D38 𐴸 HANIFI ROHINGYA DIGIT EIGHT
10D39 𐴹 HANIFI ROHINGYA DIGIT NINE

	Proposed character name	Fig. 5	Fig. 6	Fig. 7
𐴀	HANIFI ROHINGYA LETTER A	Aa	AA	AA
𐴁	HANIFI ROHINGYA LETTER BA	Ba	BA	BA
𐴂	HANIFI ROHINGYA LETTER PA	Pa	PA	PA
𐴃	HANIFI ROHINGYA LETTER TA	Ta	TA	THA
𐴄	HANIFI ROHINGYA LETTER TTA	Tda	TA	TA
𐴅	HANIFI ROHINGYA LETTER JA	Ja	JA	JA
𐴆	HANIFI ROHINGYA LETTER CA	Cha	CHA	CHA
𐴇	HANIFI ROHINGYA LETTER HA	Ha	HA	HA
𐴈	HANIFI ROHINGYA LETTER KHA	Kha	KHA	KHA
𐴉	HANIFI ROHINGYA LETTER FA	Pha	FA	FA
𐴊	HANIFI ROHINGYA LETTER DA	Da	THA	DHA
𐴋	HANIFI ROHINGYA LETTER DDA	Dha	DA	DA
𐴌	HANIFI ROHINGYA LETTER RA	Ra	RA	RA
𐴍	HANIFI ROHINGYA LETTER RRA	Rda	R̄A	RDA
𐴎	HANIFI ROHINGYA LETTER ZA	Za	ZA	ZA
𐴏	HANIFI ROHINGYA LETTER SA	Sa	SA	SA
𐴐	HANIFI ROHINGYA LETTER SHA	Sha	SHA	SHA
𐴑	HANIFI ROHINGYA LETTER KA	Ka	KA	KA
𐴒	HANIFI ROHINGYA LETTER GA	Ga	GA	GHA
𐴓	HANIFI ROHINGYA LETTER LA	La	LA	LA
𐴔	HANIFI ROHINGYA LETTER MA	Ma	MA	MA
𐴕	HANIFI ROHINGYA LETTER NA	Na	NA	NA
𐴖	HANIFI ROHINGYA LETTER WA	Wa	WA	WA
𐴗	HANIFI ROHINGYA LETTER SMALL WA	Kinnawa	KINNA WA	KINNAWA
𐴘	HANIFI ROHINGYA LETTER YA	Ya	YA	YA
𐴙	HANIFI ROHINGYA LETTER SMALL YA	Kinnaya	KINNA YA	KINNAYA
𐴚	HANIFI ROHINGYA LETTER NGA	Nga	GAN	GHAN
𐴛	HANIFI ROHINGYA LETTER NYA	Naiya	NAYYA	NAYA

Table 1: Romanized names for Rohingya letters as given in various sources.

	Proposed character name	Fig. 5	Fig. 6	Fig. 7
𐴝	HANIFI ROHINGYA VOWEL MARK A	Aafor	AFOR	AFOR
𐴞	HANIFI ROHINGYA VOWEL MARK I	Efor	[I]FOR	EIFOR
𐴟	HANIFI ROHINGYA VOWEL MARK U	Ufor	UFOR	UOFOR
𐴠	HANIFI ROHINGYA VOWEL MARK E	Aefor	EFOR	EAFOR
𐴡	HANIFI ROHINGYA VOWEL MARK O	Ofor	OFOR	WOFOR
𐴢	HANIFI ROHINGYA MARK SAKIN	—	—	—
𐴣	HANIFI ROHINGYA MARK NA KHANNA	Nakhonna	NAKONNA	NAKHANNA
◌𐴤	HANIFI ROHINGYA SIGN HARBAHAY	Haarbai	HARBAY	HAR BAY
◌𐴥	HANIFI ROHINGYA SIGN TAHALA	Tela	TELA	TAHA LA
◌𐴦	HANIFI ROHINGYA SIGN TANA	Tana	TANA	TA NA
◌𐴧	HANIFI ROHINGYA SIGN TASSI	Tossi	TASSI	TASSI

Table 2: Romanized names for Rohingya marks as given in various sources.

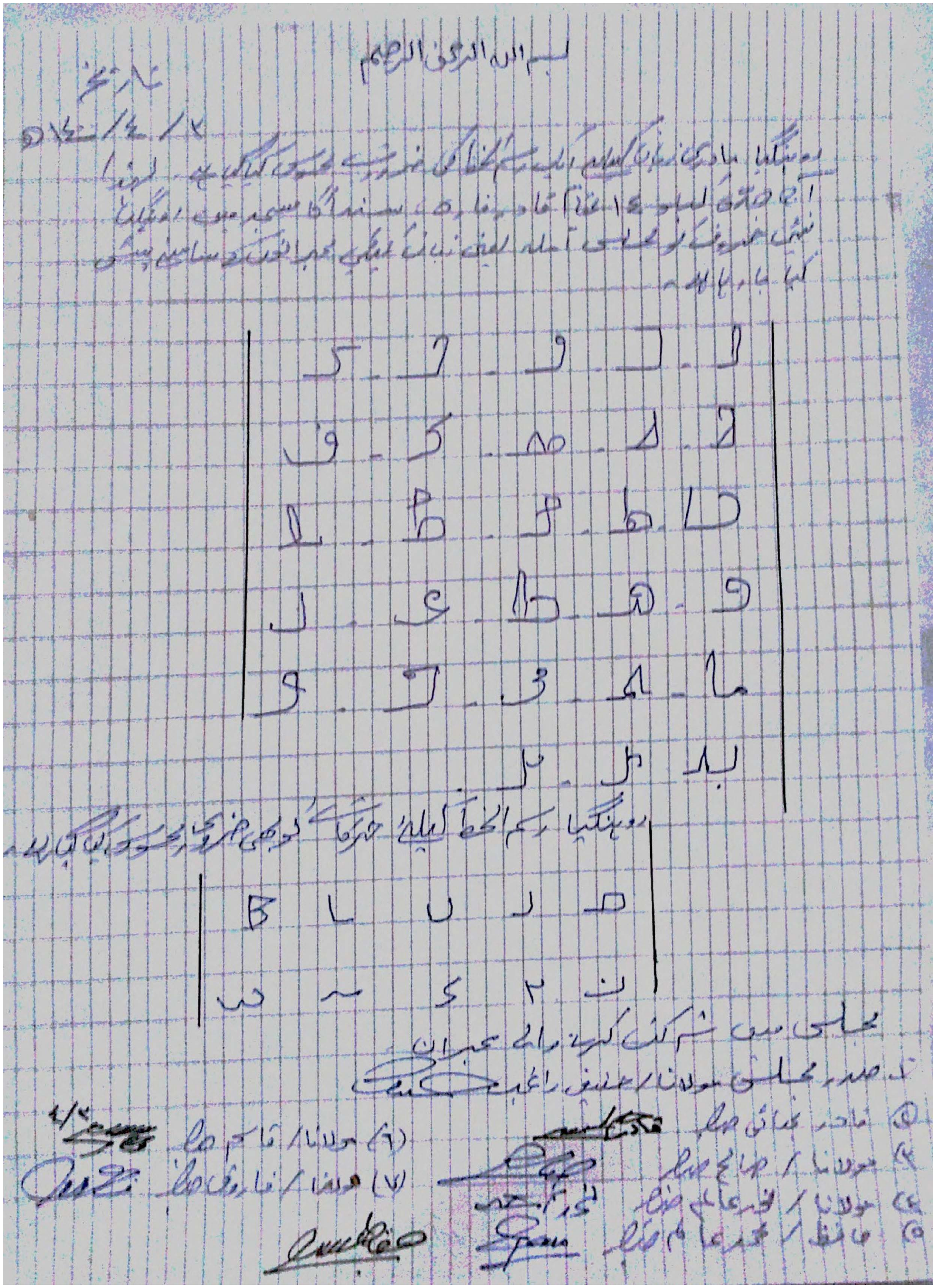


Figure 1: A document showing the Rohingya script as finalized by Maulana Mohammad Hanif and others on February 19, 1980, with signatures of the script committee.

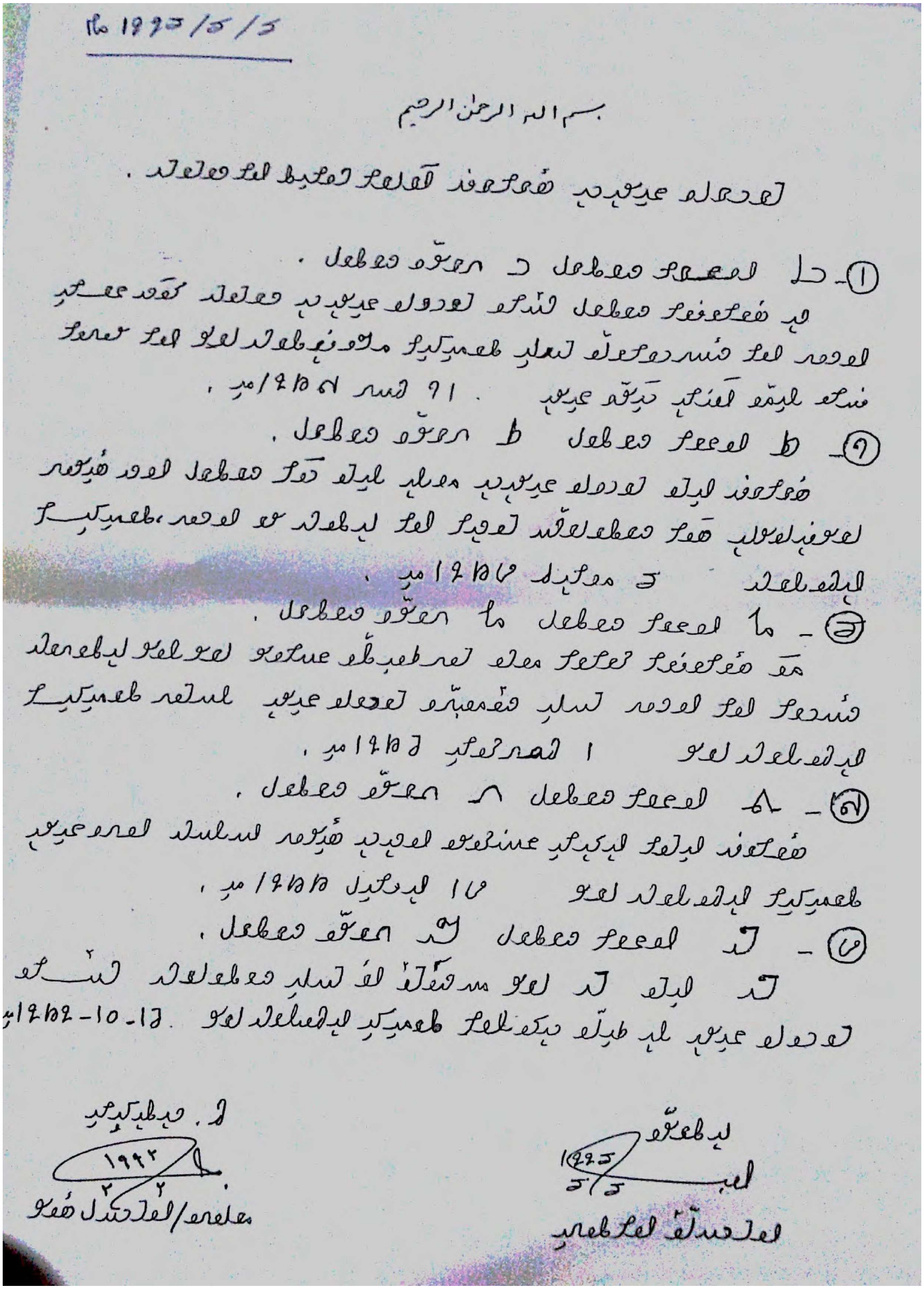
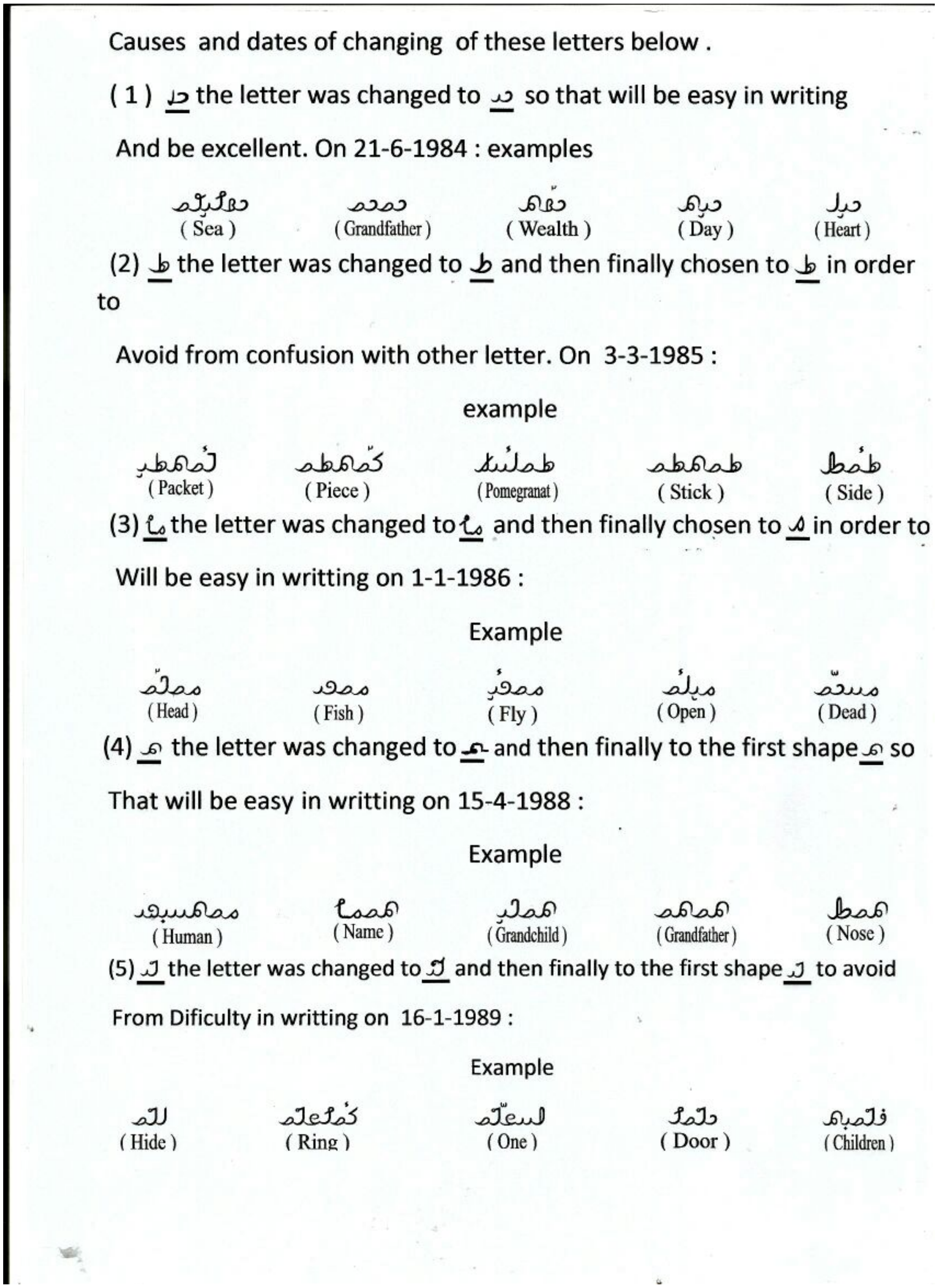

بسم الله الرحمن الرحيم

Figure 2: Description of some characters attached to the chart shown in figure 1. A translation is given in figure 3.


Causes and dates of changing of these letters below .

(1) the letter was changed to so that will be easy in writing

And be excellent. On 21-6-1984 : examples

(Sea) (Grandfather) (Wealth) (Day) (Heart)

(2) the letter was changed to and then finally chosen to in order to

Avoid from confusion with other letter. On 3-3-1985 :

example

(Packet) (Piece) (Pomegranat) (Stick) (Side)

(3) the letter was changed to and then finally chosen to in order to

Will be easy in writting on 1-1-1986 :

Example

(Head) (Fish) (Fly) (Open) (Dead)

(4) the letter was changed to and then finally to the first shape so

That will be easy in writting on 15-4-1988 :

Example

(Human) (Name) (Grandchild) (Grandfather) (Nose)

(5) the letter was changed to and then finally to the first shape to avoid

From Dificulty in writting on 16-1-1989 :

Example

(Hide) (Ring) (One) (Door) (Children)

Figure 3: Translation of the text shown in figure 2.

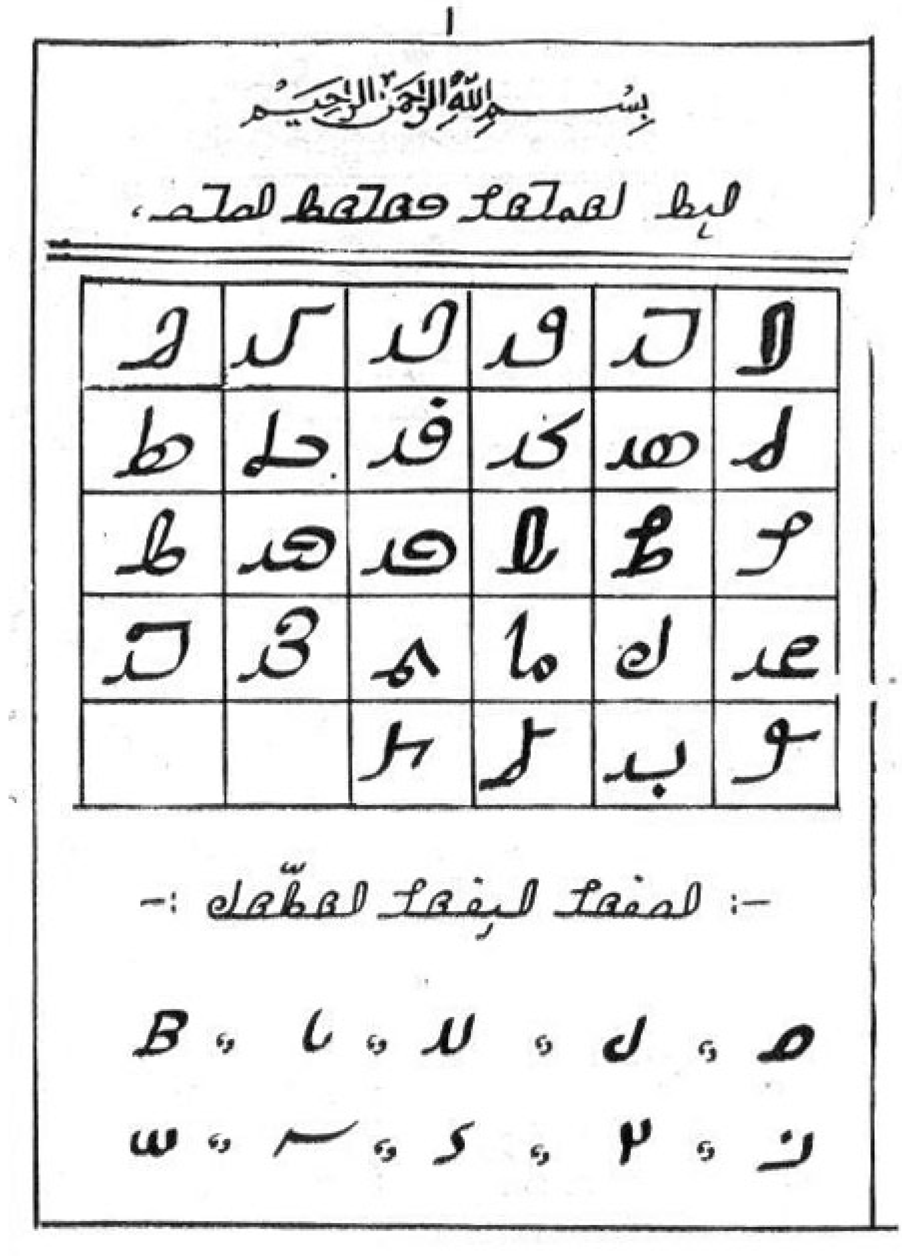


Figure 4: Chart of Rohingya script from a hand-written primer (from Ruwainggya Zuban Komiti (A): 1).

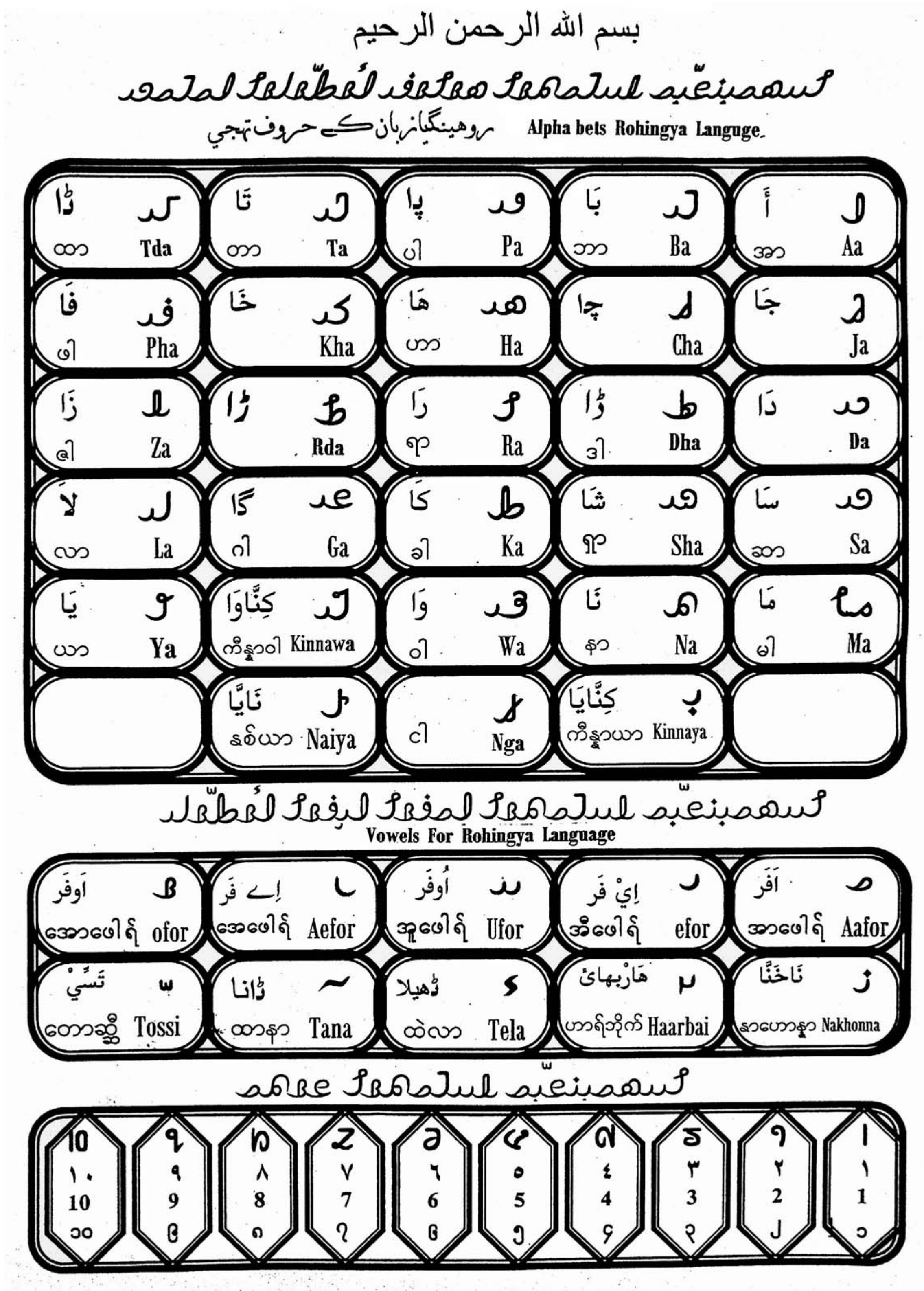


Figure 5: Chart showing Rohingya letters and signs with Urdu and Burmese names.

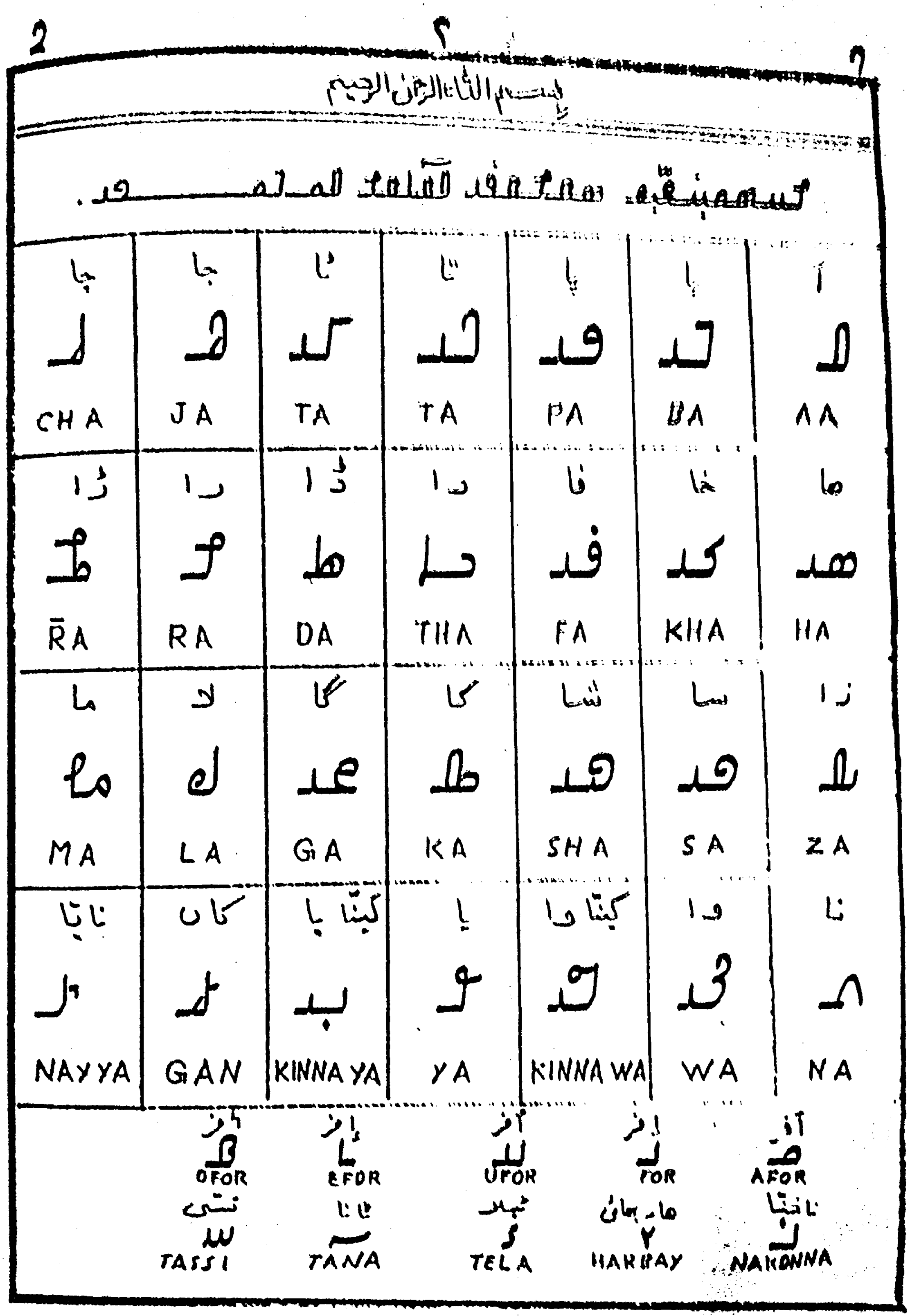


Figure 6: Chart showing Rohingya letters with Arabic correspondences and names in Latin transliteration.

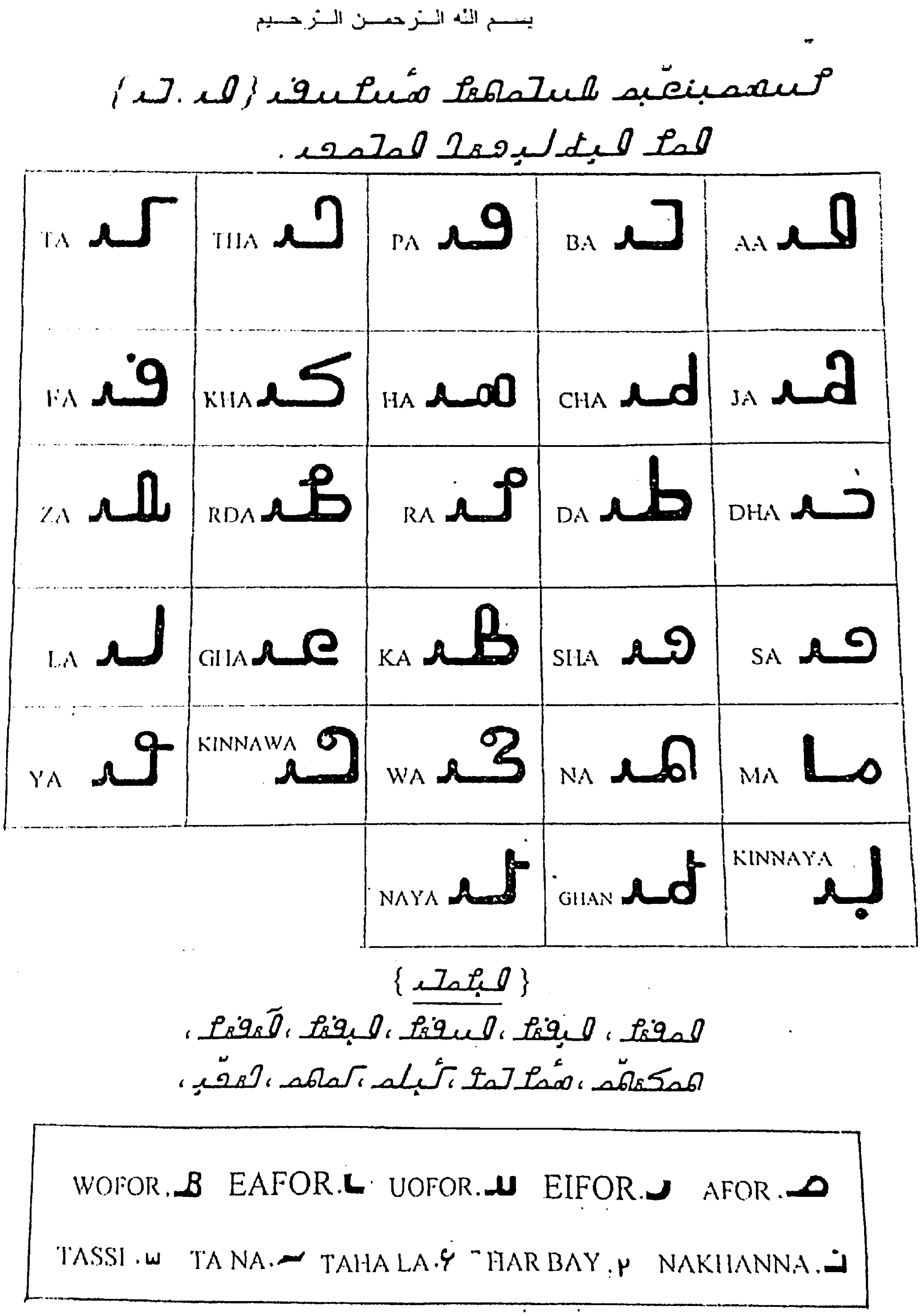


Figure 7: Chart showing Rohingya letters with Latin transliteration.

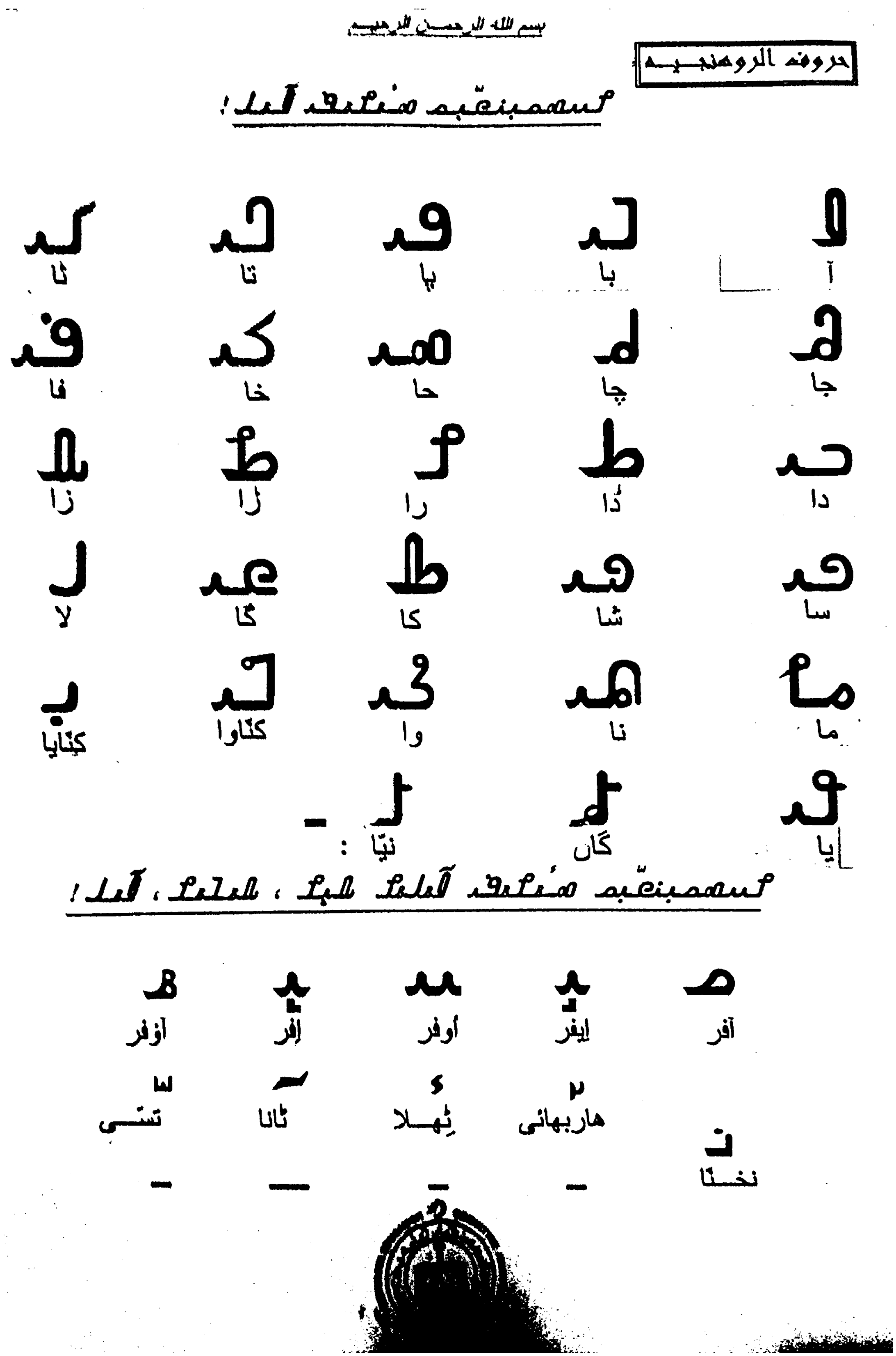


Figure 8: Page from a Rohingya primer showing Rohingya letters with names in Arabic transliteration.



Figure 9: Page from a Rohingya primer showing the method of writing 𐴝 VOWEL MARK A and 𐴞 VOWEL MARK I.

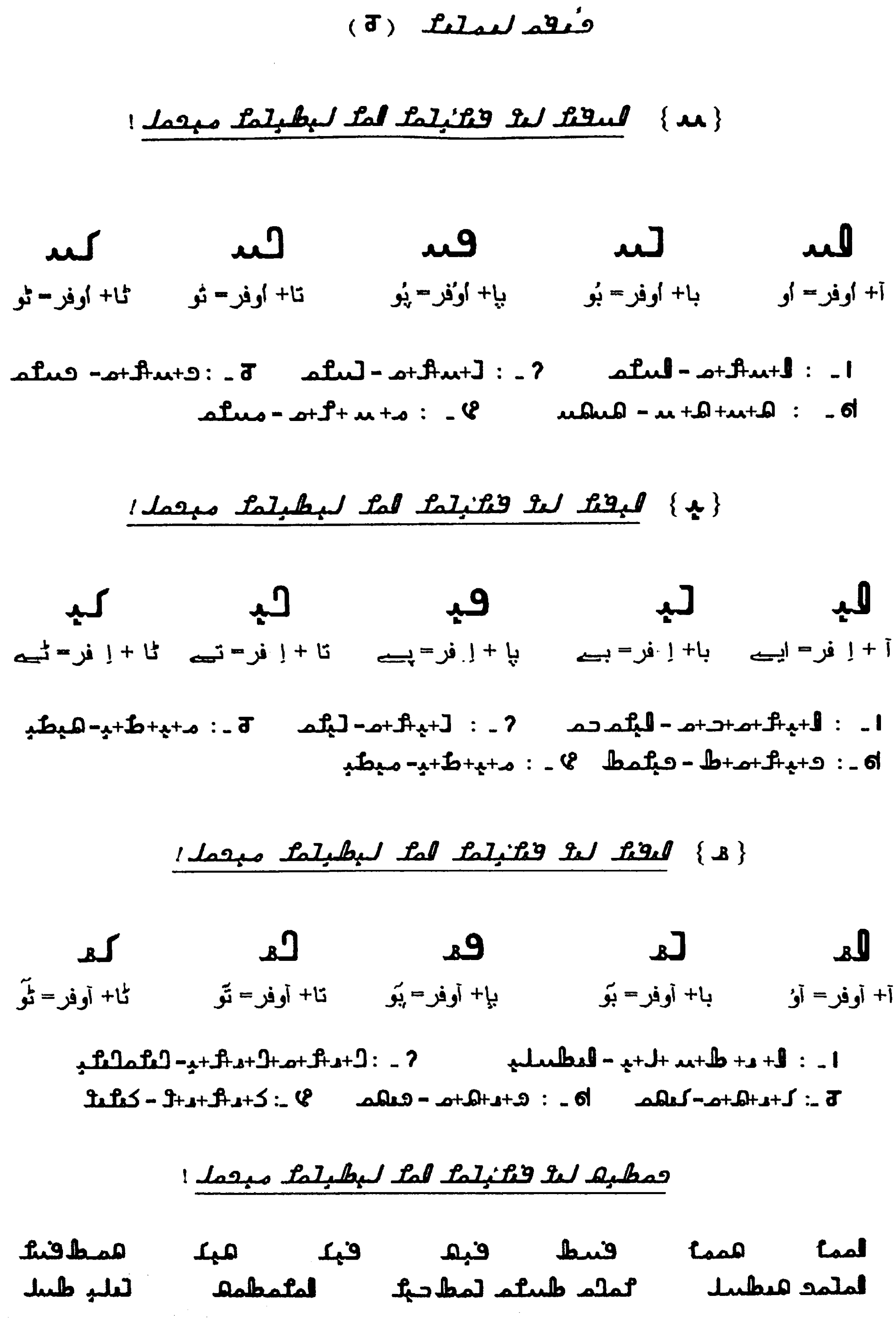


Figure 10: Page from a Rohingya primer showing the method of writing 𐴟 VOWEL MARK U, 𐴠 VOWEL MARK E, 𐴡 VOWEL MARK O.



Figure 11: Page from a Rohingya primer showing the method of writing the 𐴢 MARK NA KHANNA, ◌𐴤 SIGN HARBAHAY, ◌𐴥 SIGN TAHALA, ◌𐴦 SIGN TANA, ◌𐴧 SIGN TASSI.

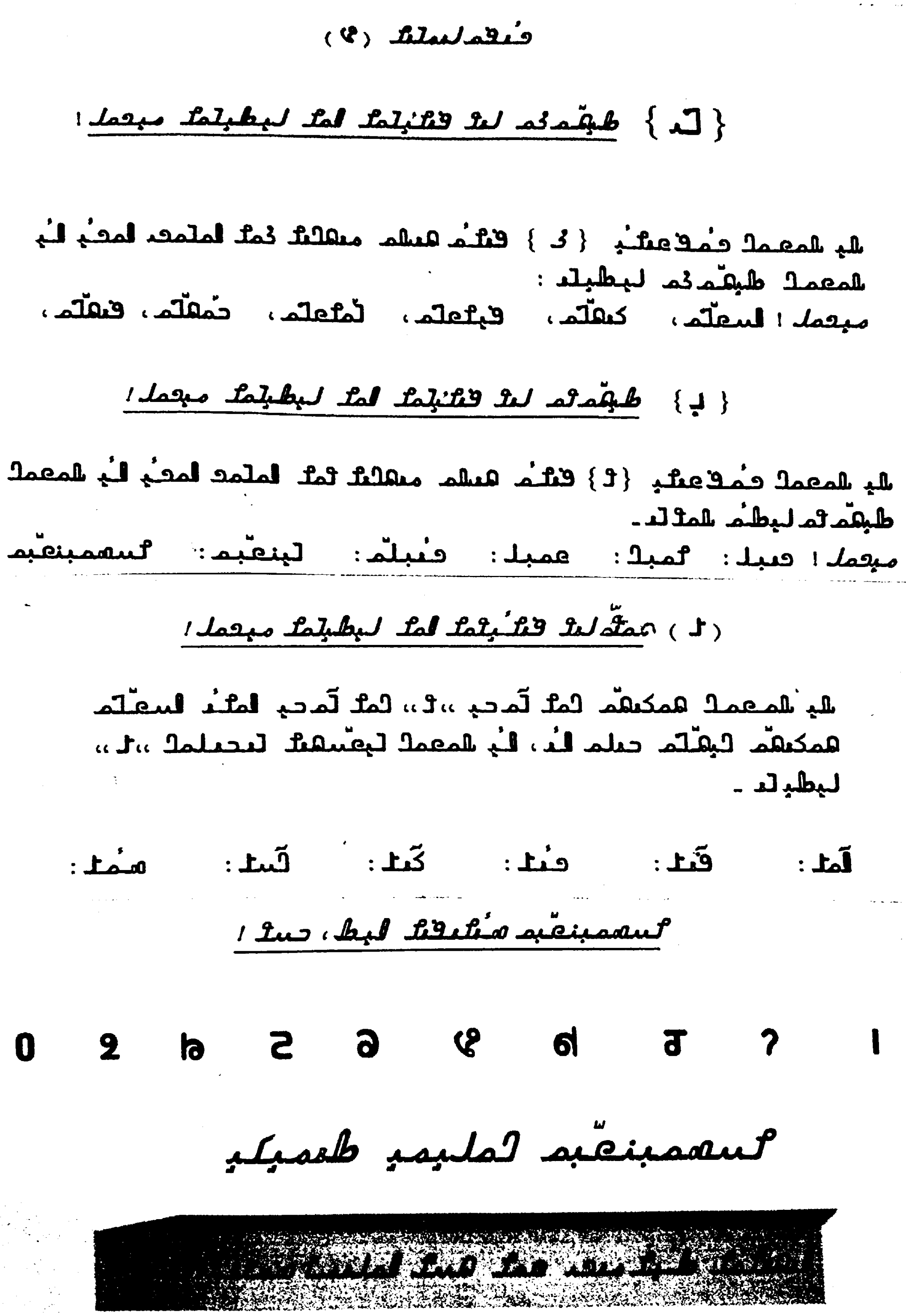


Figure 12: Page from a Rohingya primer describing the use of 𐴌 KINNA WA and 𐴘 KINNA YA.

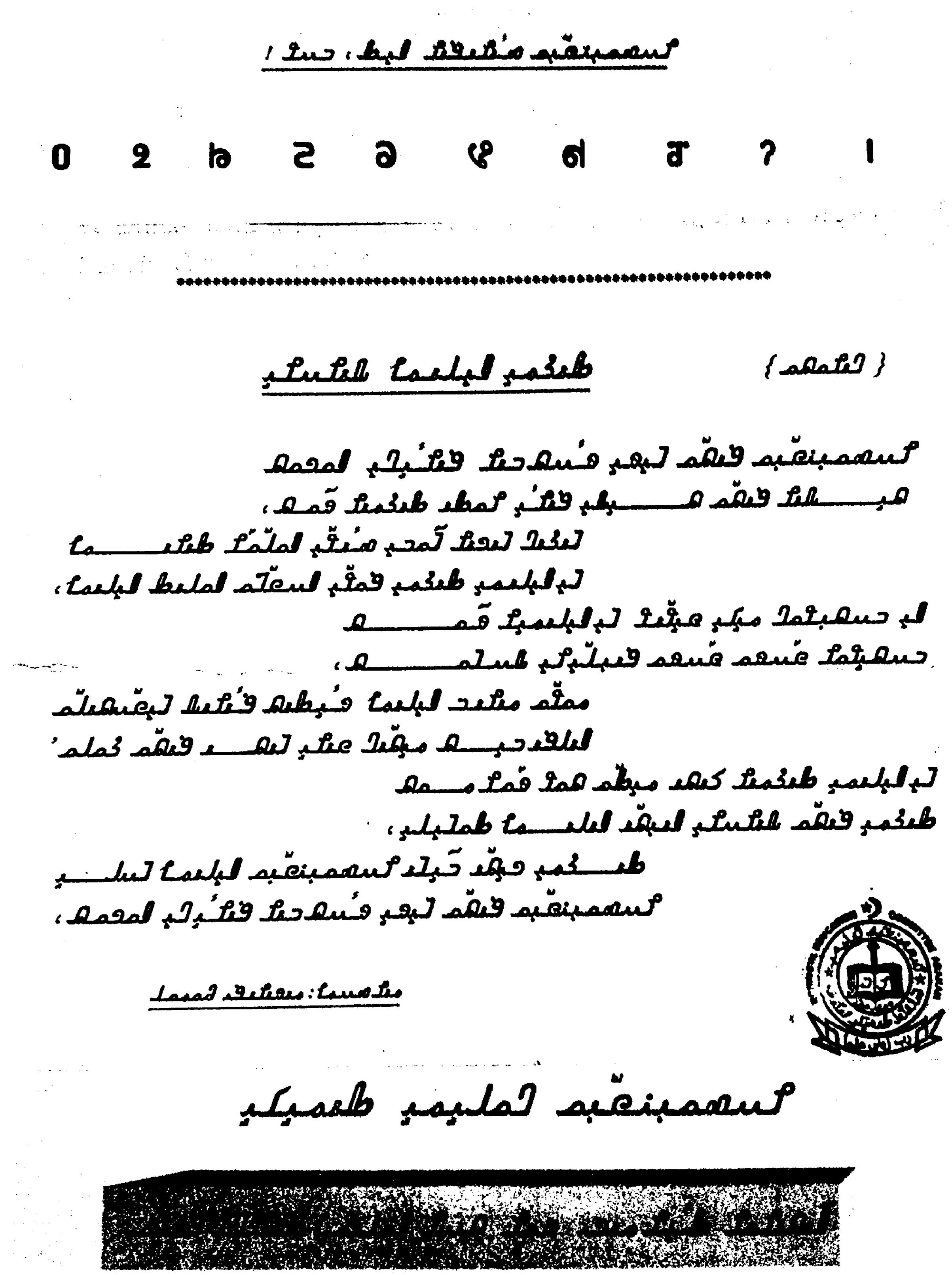


Figure 13: Page from a Rohingya primer showing the use of *tatweel*.

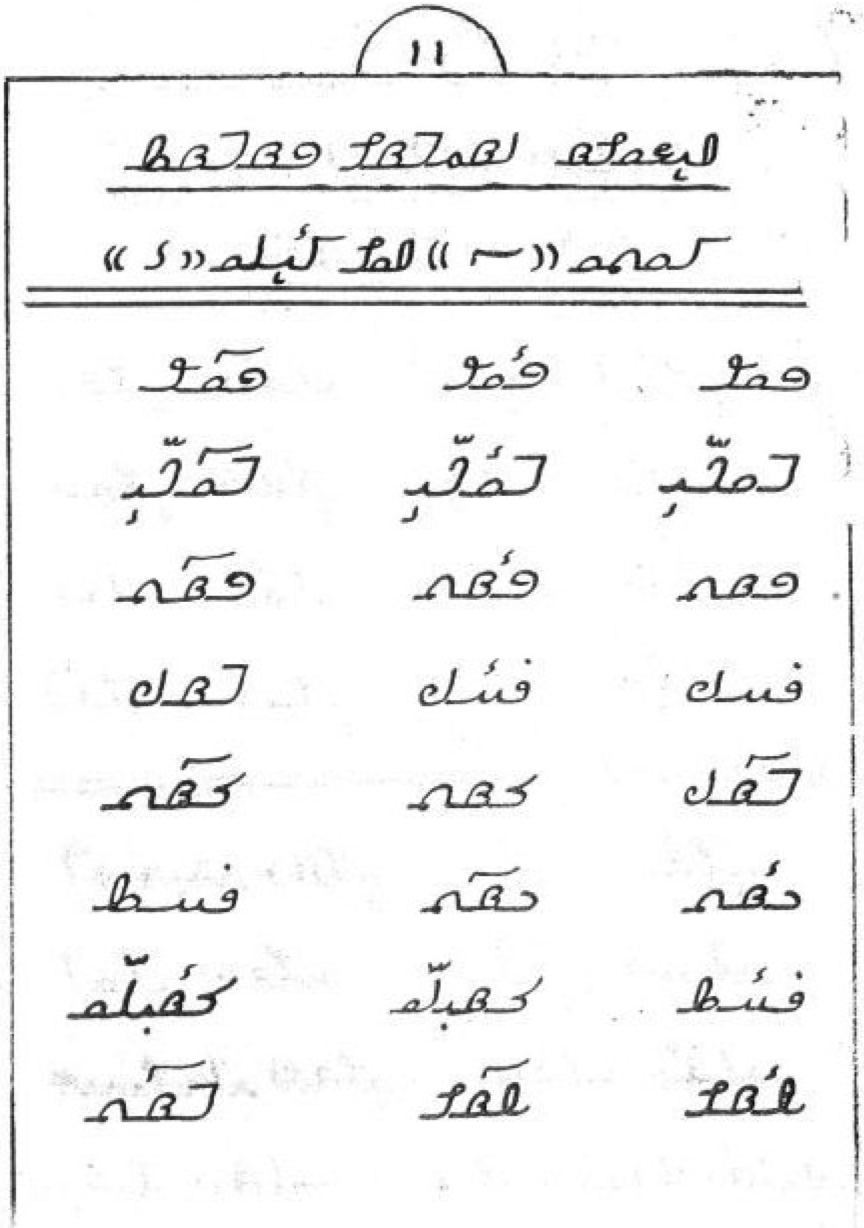


Figure 14: Table showing use of tonal signs from a hand-written primer (from Ruwainggya Zuban Komiti (A): 11).

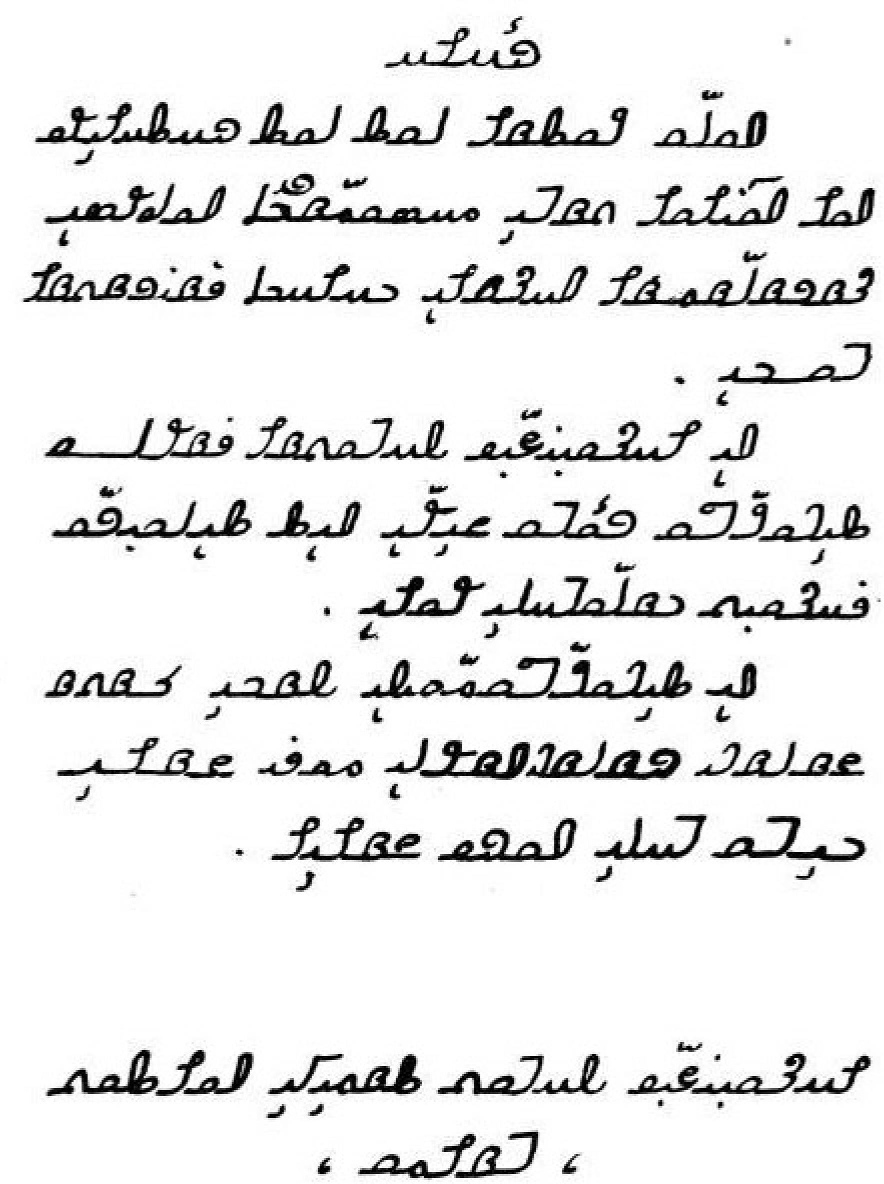


Figure 15: Example of running Rohingya text from a hand-written primer (from Ruwainggya Zuban Komiti (B): 1).

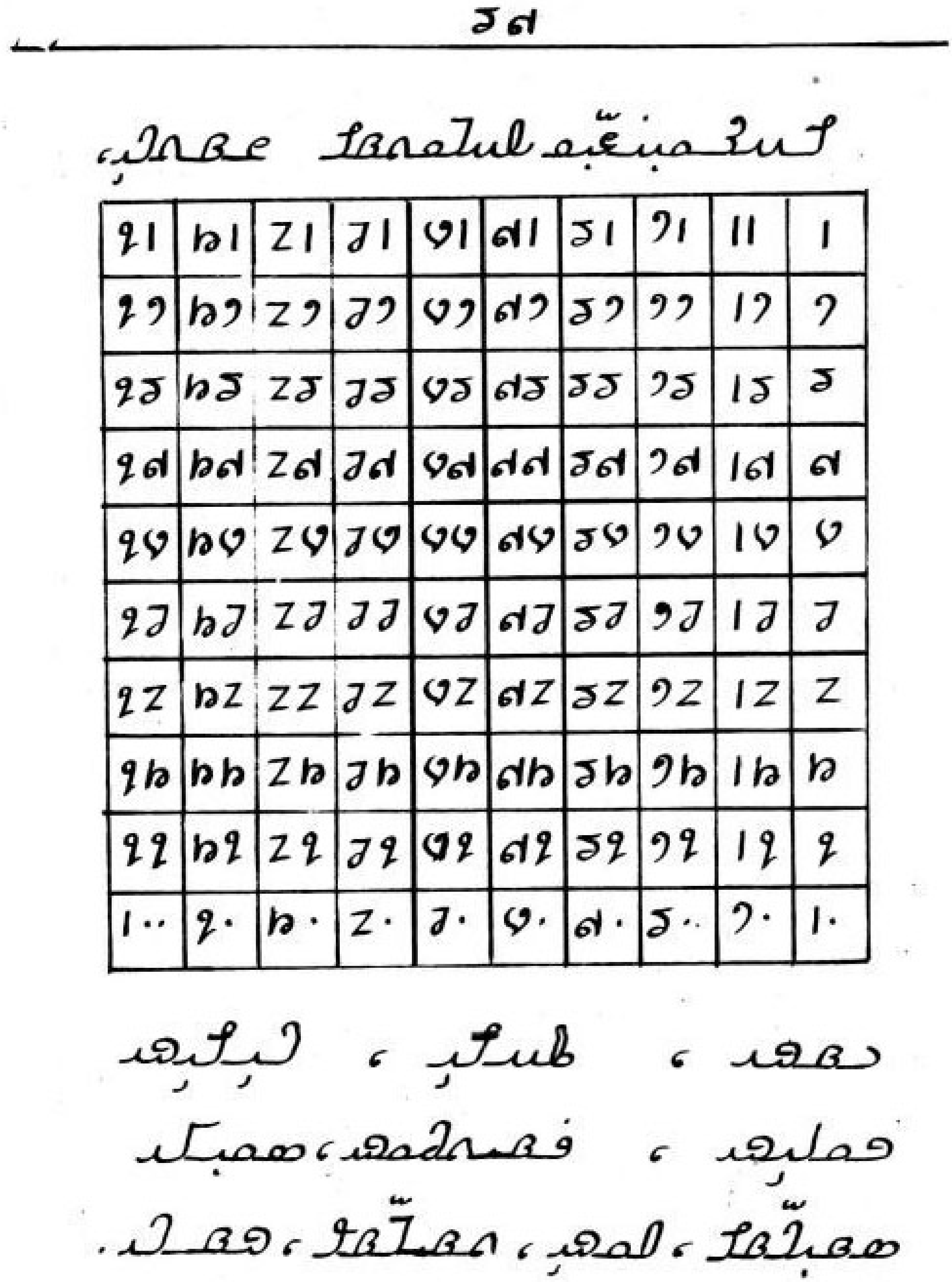


Figure 16: Chart of digits from a hand-written primer (from Ruwainggya Zuban Komiti (B): 34).

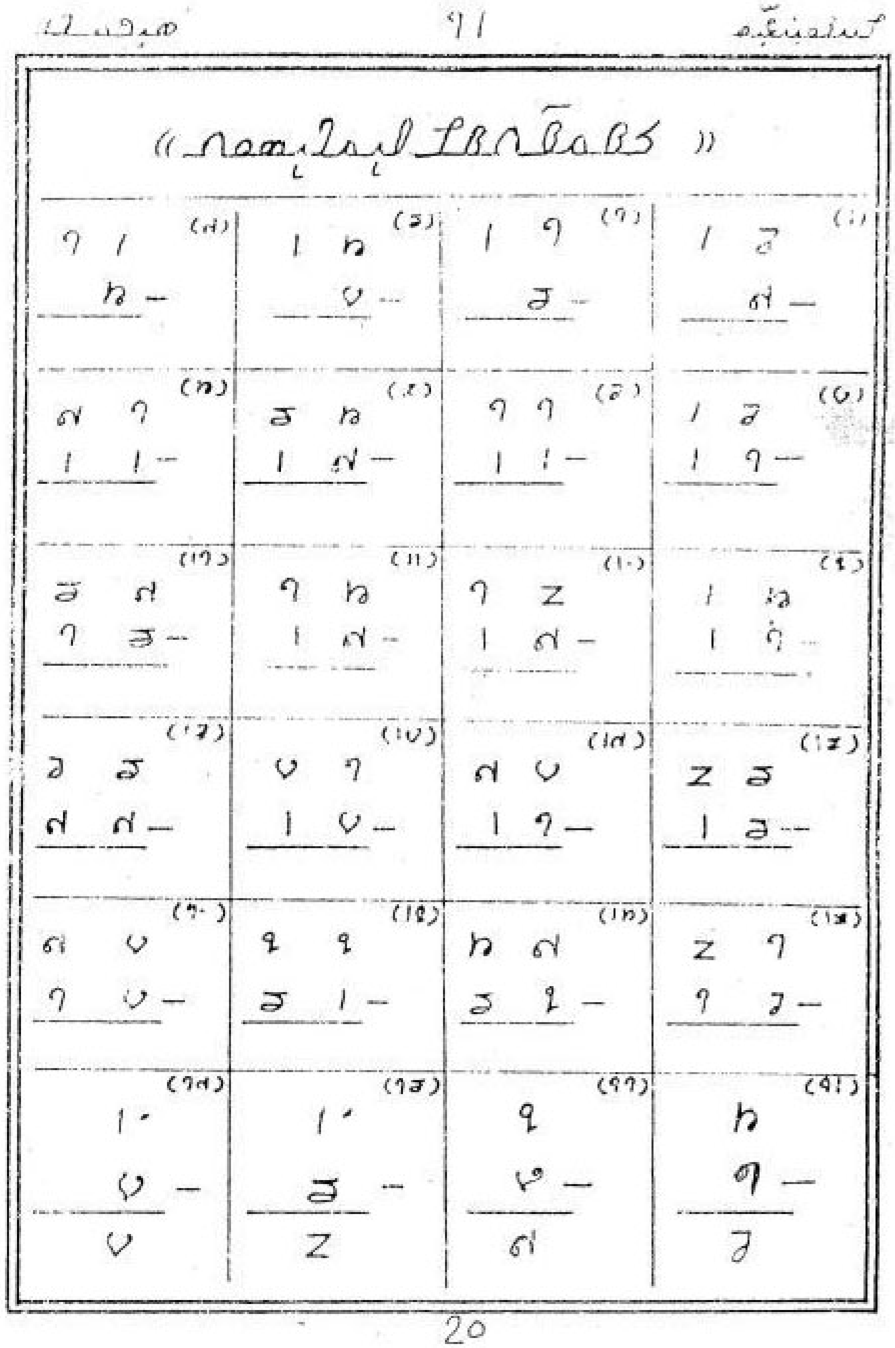


Figure 17: Excerpt from an primary-level arithmetic book written in Rohingya (from Ruwainggya Education Board Myanmar: 21).


5. December 2002.
The Rohaingya Language HAQ — DAR Monthly Founder Muhammad Iskander Imam

Figure 18: The cover page of *Haq-Dar*, a Rohingya language news weekly (December 5, 2002).


علم الإنسان ما لم يعلم

THE MONTHLY
ROHINGYA POTTORO
SERAK

SATUR DAY, OCTOBER 13, 2007

Figure 19: The cover page of *Serak*, a Rohingya language news weekly (October 13, 2007).

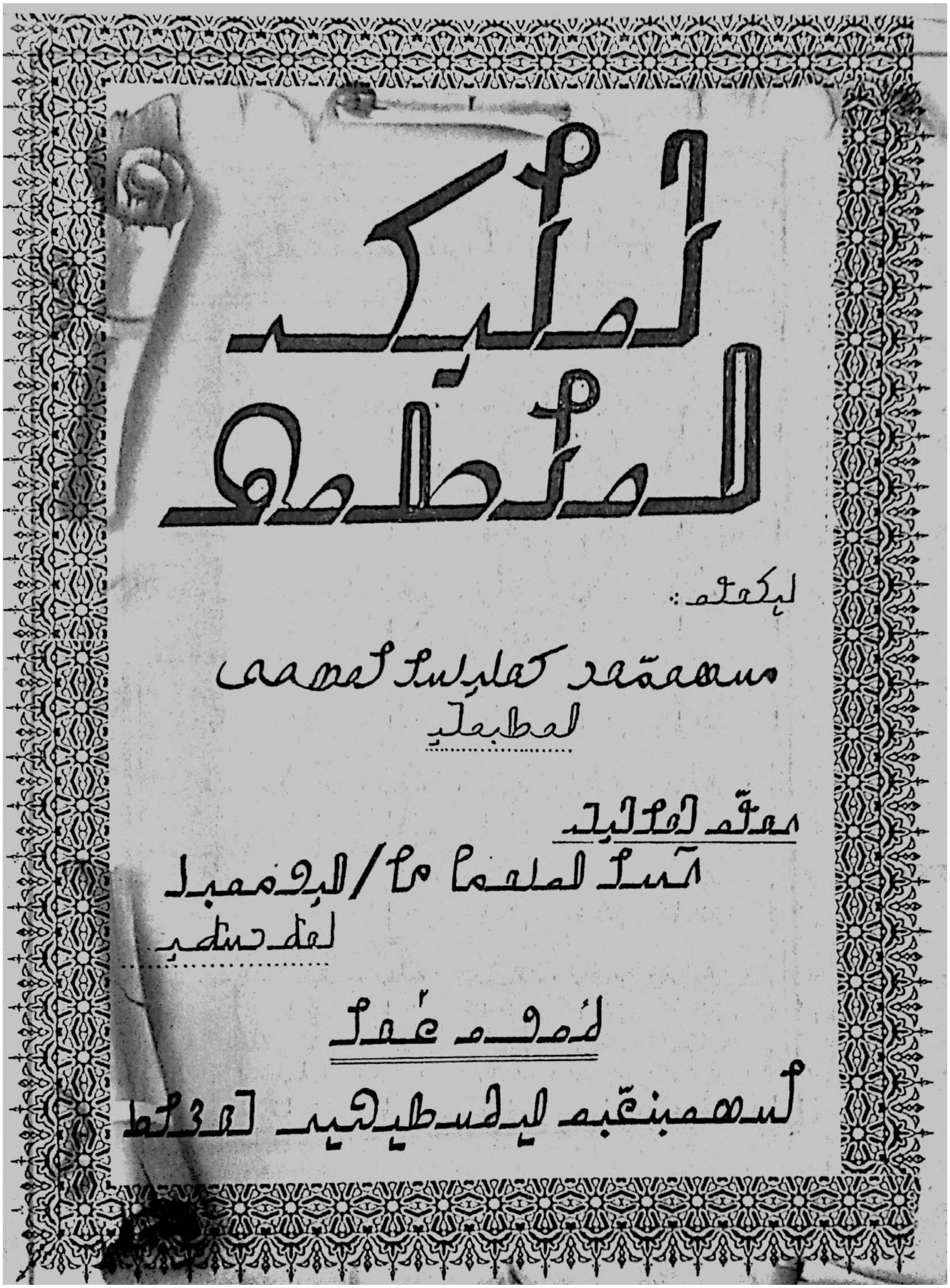


Figure 20: Hand-written cover page of *History of Arakan*. The vertical breaks in the letters 𐴃 TA and 𐴌 RA in the title word 𐴃𐴝𐴌𐴞𐴈 𐴀𐴝𐴌𐴝𐴑𐴝𐴕 *tarikh arakan* are stylistic, as are the broken baseline conjuncts through the title.

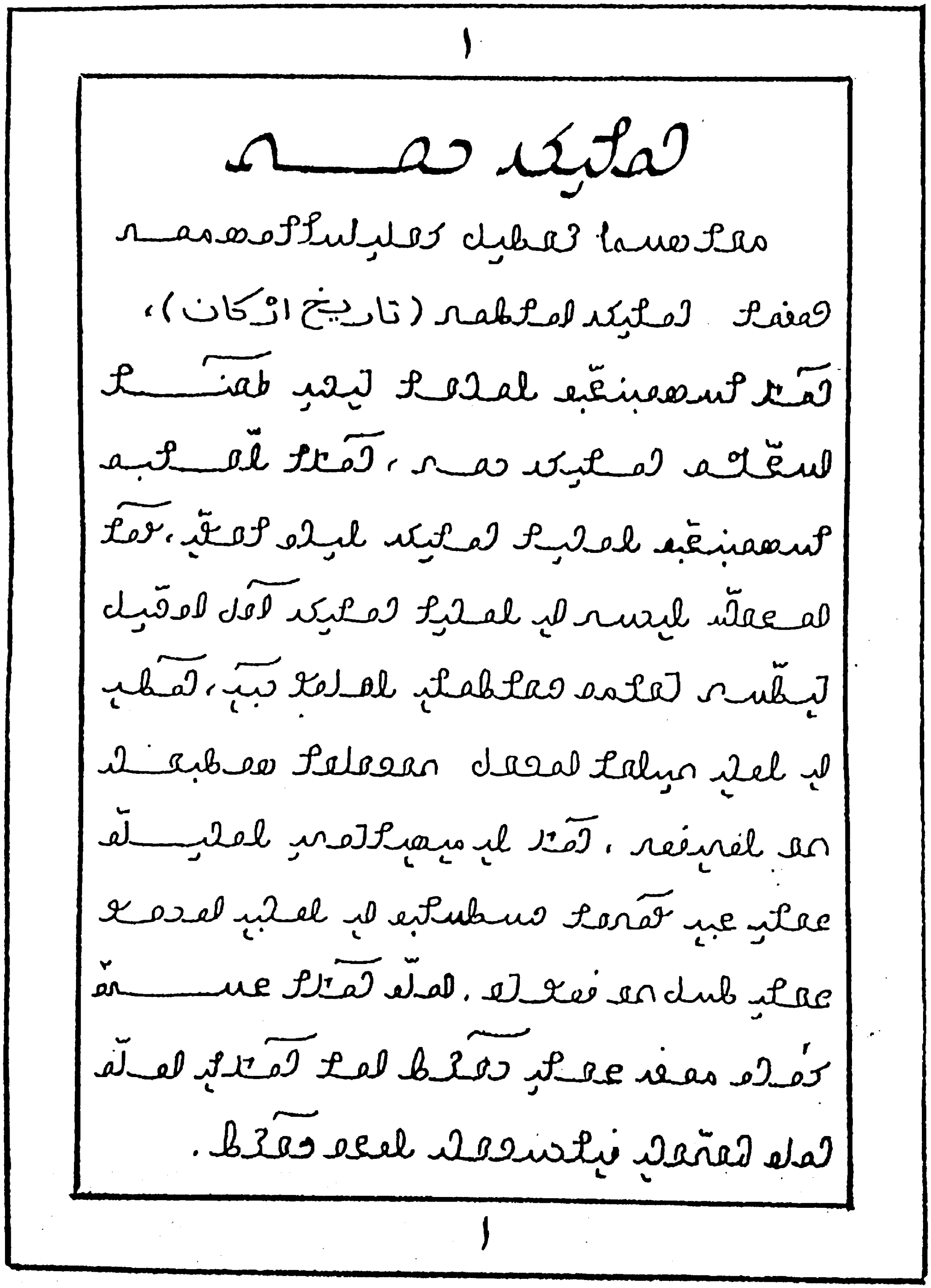


Figure 21: Hand-writen first page of *History of Arakan*.

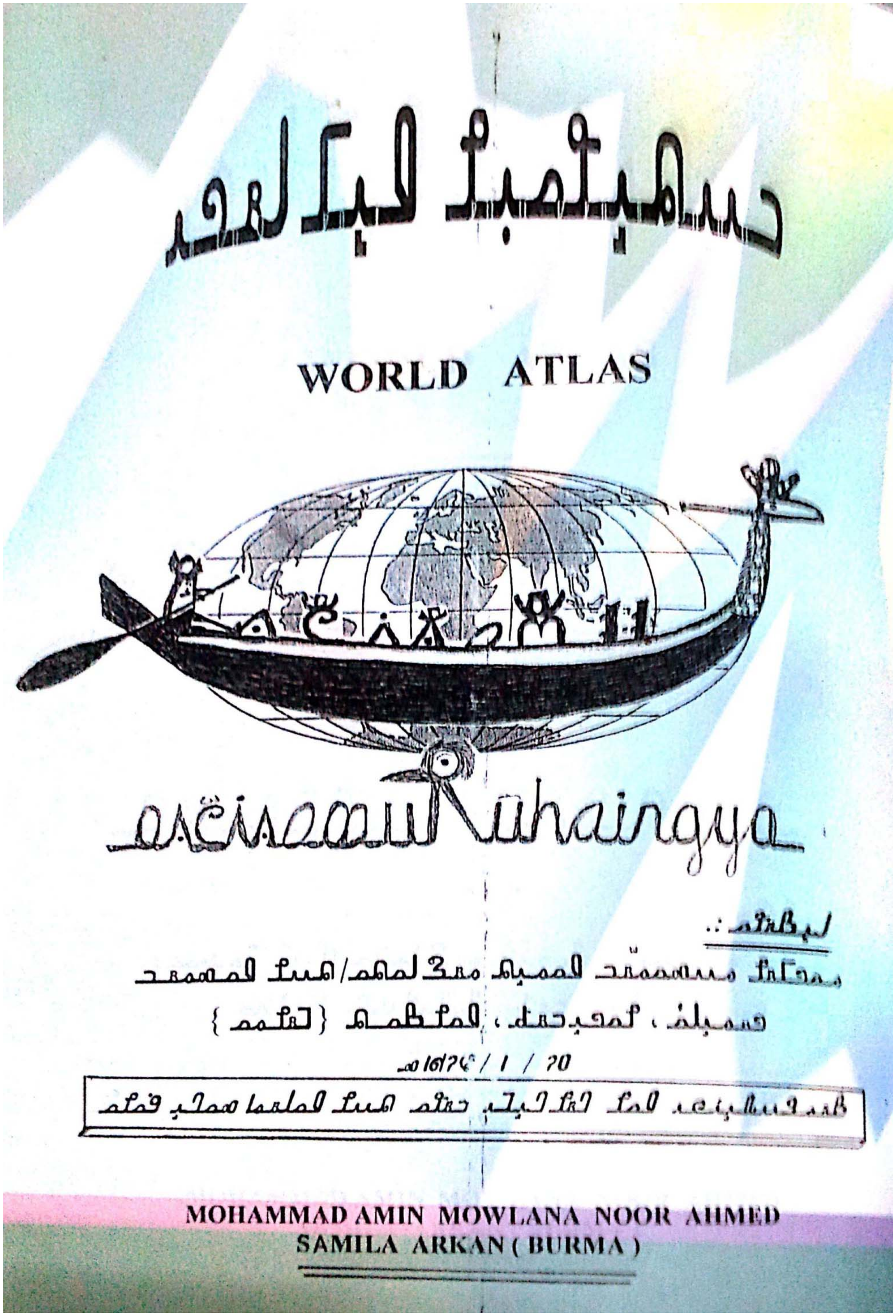


Figure 22: Cover of *World Atlas*.

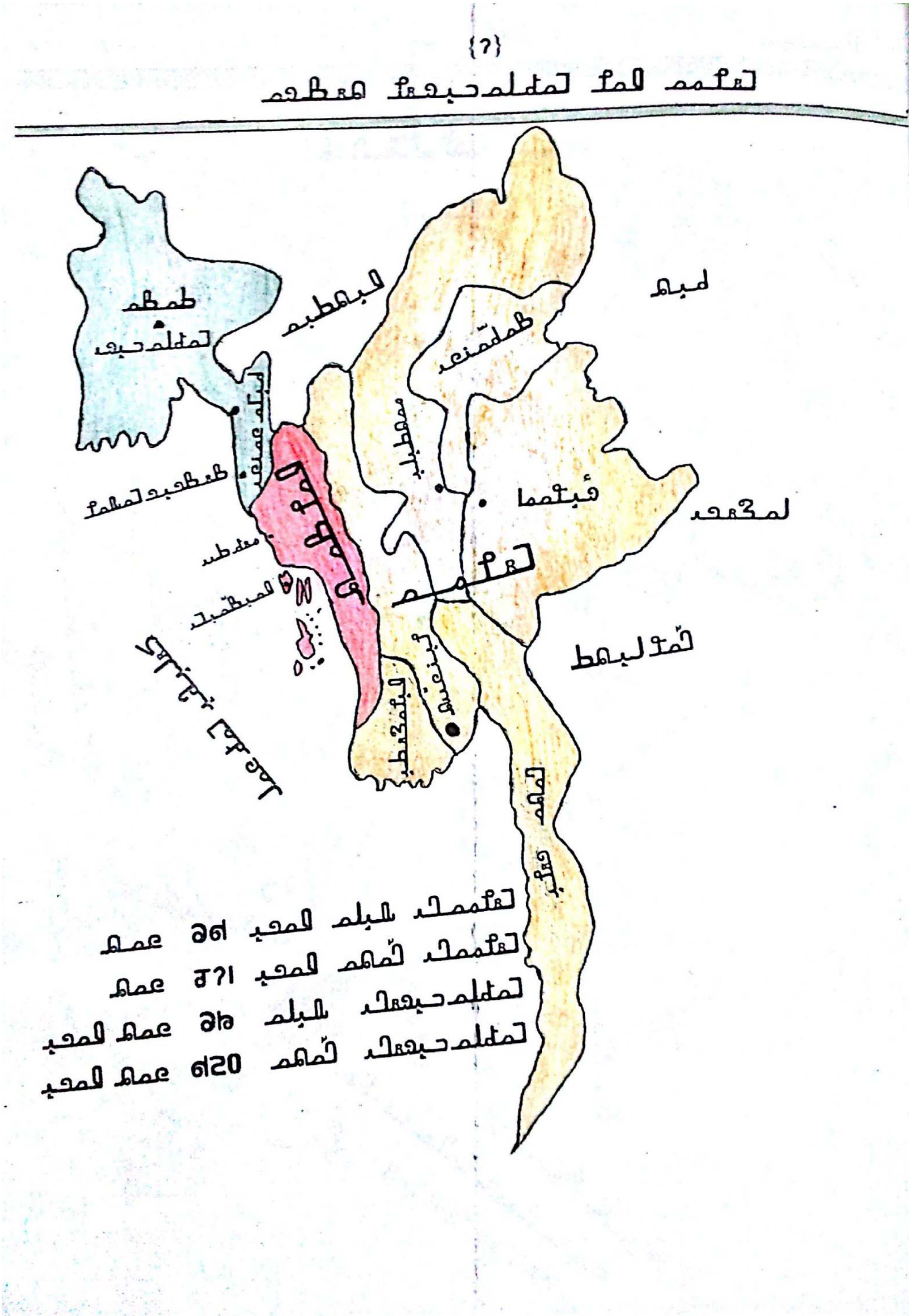


Figure 23: Page from *World Atlas* showing Myanmar (with the Arakan region highlighted) and Bangladesh.